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No. 11

WORK OF THE LAKE CARRIERS' ASSOCIATION.

When the vessel interests of the lakes met the grain merchants, elevator owners and trunk line railway representatives of the country in Buffalo, a few days ago, to discuss the grain bill of lading, it was certainly to their advantage to have as a presiding officer for the conference a man like Mr. Frank J. Firth of Philadelphia, who was recently elected president of the Lake Carriers' Association. The grain merchants of New York and other seaboard points were not, of course, fully acquainted with the aims of the Lake Carriers' Association, although they had used the vessels of the association, through representatives in Duluth, Chicago and Buffalo, for the transportation of millions of bushels of grain each year, in which they are interested almost from the time it leaves the farmer until it is delivered to the consumer on the other side of the Atlantic. Mr. Firth's explanation at the opening of the conference as to the Lake Carriers' Association and its work, was brief but very interesting. He said:

"The Lake Carriers' Association is not a traffic association. It does commercial and other organizations that have accepted its invitation and sent representatives to this conference. The presence of the gentlemen who are with us today evidences the importance of the questions that are to be considered. Before submitting these questions to the meeting, it appears to be desirable to offer a word of explanation as to the Lake Carriers' Association and its work.

"The Lake Carriers' Association is not a traffic organization. It does not undertake to in any way regulate rates of freight. It aims to embrace in its membership all owners of vessels navigating the great lakes, and, as these owners are scattered through all of the many states bordering upon the great lakes, the association is entitled to and enjoys an important influence in the determination of questions affecting lake interests. It has uniformly exercised this influence for the public good. At each session of congress its representatives are on hand to present and urge the needs of lake navigation; to advocate beneficial legislation and to oppose legislation ill-considered or antagonistic.

"By pursuing a careful and conservative course in its recommendations the Lake Carriers' Association has secured the confidence of our national authorities, and a generous response has been made annually to its claims for the removal of obstructions to navigation; deepening channels, improving harbors, and so thoroughly lighting and buoying all lake water ways as to minimize the dangers of navigation. As rapidly as the United States government has improved and deepened its channels, the Lake Carriers have responded with larger vessels, heavier cargoes and lower rates of freight. While the government work has been in progress, and before its lights could be placed, the Lake Carriers' Association has at its own cost provided temporary lights necessary to make the partially completed channels immediately available. When the government channels were so located that they could only be properly lighted from Canadian waters or from the Canadian shores, the Lake Carriers' Association appealed to the Canadian government to furnish these lights, and when this was refused the Lake Carriers' Association, at its own expense, placed the light-ships in the Canadian waters and the fixed lights upon the Canadian shores, trusting that its own government would in due time find some method under which this burden could be removed from the Lake Carriers' Association and the amounts it had meanwhile advanced be refunded.

"Such has been the work of the Lake Carriers' Association, and what have been its results? During eight months of every year there passes through the Detroit river a tonnage that as to its volume and the safety, economy and despatch with which it is handled, stands unrivalled in the world. The Lake Carriers' Association has not only carried the products of our farms, mines, forests and factories at the lowest known rates, but it has so minimized the dangers of navigation that the cost to the merchants, who handle and profit by the lake commerce, for the marine insurance on their cargoes has been so greatly reduced as to be no longer an important factor in their commercial calculations. It is the just ambition of the Lake Carriers' Association to maintain this proud position of leadership in efficient and economical public service, and with your cooperation this ambition may be realized. During the passing years there has been built upon no more secure foundation than a rising custom, two barriers that impede the further progress of the Lake Carriers' Association, and your assistance has been invoked to find a method of removing these barriers."

Then followed the explanation of changes desired by the vessel owners in the grain bill of lading.

STEAM PUMP CONSOLIDATION.

New York dispatches report that the house of Henry R. Worthington, which was at first indifferent to the plans of consolidation of steam pump manufacturing concerns, is now in favor of a combination and is working to that end. The six concerns upon whose properties options have been secured are: Henry R. Worthington of Brooklyn, N. Y., Blake & Knowles of New York and Boston, Deane Steam Pump Co. of Holyoke, Mass., Snow Steam Pump Co. of Buffalo, N. Y., Laidlaw-Dunn Gordon Co. of Cincinnati and the Holly Manufacturing Co. of Lockport, N. Y. The capitalization proposed is \$27,500,000, and this may be increased in view of the fact that two other central western companies, one of which is in Cincinnati, may yet be taken in. The outside capital that may come in will not be a large factor, it is stated, a majority of the stock being in the hands of the constituent companies. The underwriting of the enterprise is in the hands of Kuhn, Loeb & Co. and P. Lehman, of New York.

LAKE SUPERIOR IRON CO. SALE.

Special interest still attaches to the proposed sale of the property of the Lake Superior Iron Co., which includes some 16,000 acres of mineral lands, producing almost every kind of ore known to the Lake Superior region, as well as a complete mining organization and a fleet of steel ships for the transportation of the ore. One of the latest rumors is that the intending purchasers are the former owners of the Norrie mine, who sold out some time ago to the Carnegie-Oliver interest. But this is only a guess. Everybody connected with the iron and steel industries knows, however, that even in the hands of the old owners of the Norrie, who are connected with no consuming interest, the big Lake Superior property would not be operated under the extreme conservative policy that has characterized its affairs in the past. A second circular to stockholders from the Boston office of the company gives no information as to the parties seeking control, but offers to let all stockholders into the sale with the understanding that their shares are not to be disposed of at less than \$40 each. This second circular is as follows:

"Several times during the past year and again recently some of your directors and other holders of large amounts of stock in the company have been approached by parties to purchase the control of the capital stock, and the question of a sale has been favorably considered. In order to properly and effectively manage this business and give all who wish an opportunity to join in any sale that may be made within the next three months, a committee consisting of Messrs. George W. R. Matteson, president of the company, and Henry H. Fay, vice president, has been selected by the directors to act in the matter. The committee will receive stock from stockholders who desire to participate in any sale that may be made, up to noon on April 1 next, at the office of the company, No. 28 State street, Boston. All stock so deposited must be accompanied by a duly executed power of attorney for the transfer of same. If a majority of the capital stock of the company is so received by noon on April 1 next, the committee will negotiate for a sale of the stock so deposited with it and will sell and deliver the same at such price and upon such reasonable terms as a majority of the board of directors shall determine. No sale, however, will be made at a price of less than \$40 per share, and the committee will, in their discretion, refuse to accept any or all offers. On June 1 next, if a sale has not been effected, the powers of attorney will be cancelled and the stock so deposited will be returned to the owners upon presentation at the Boston office of the company of the receipts that will be given for same. The members of the committee are serving gratuitously and each undertakes no responsibility in the matter excepting the exercise, by himself, of good faith."

NAMES OF ROCKEFELLER SHIPS.

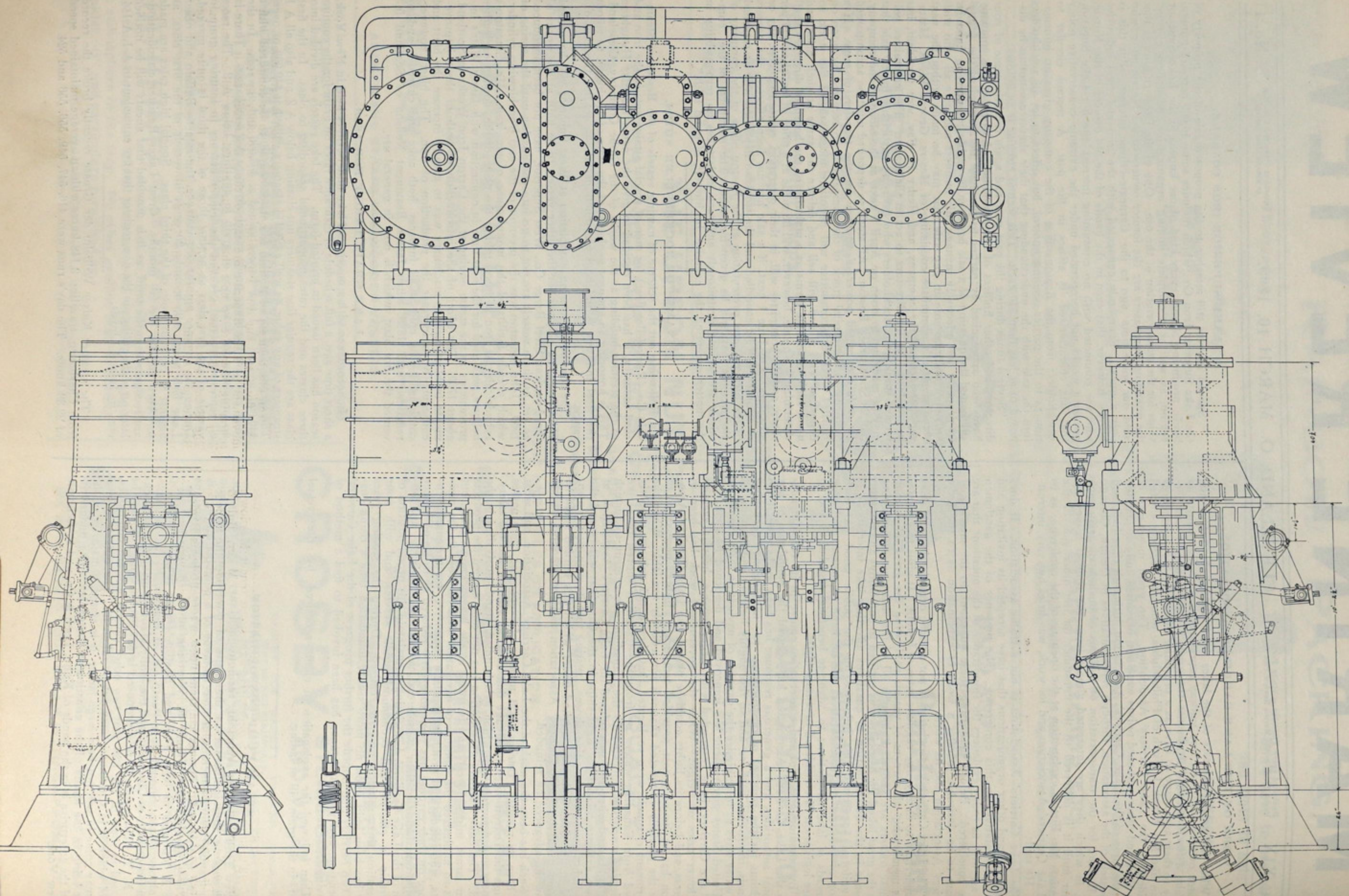
Following out the scheme of naming vessels of the Bessemer Steamship Co. (Rockefeller fleet) for men of special attainments in the iron and steel industry, it has been decided to give the name Douglas Houghton to the steamer building at the works of the Globe Company, Cleveland. This is honoring an eminent geologist of the state of Michigan, to whom the steel industry is indebted for much pertaining to the Gogebic ore range.

The tow barge nearing completion at West Superior will be named John Smeaton. Names for the other vessels to be built at the works of the American Steel Barge Co., West Superior, have not been announced as yet, as these vessels are not to go into commission until the spring of 1900. John Smeaton was the inventor of the cast iron blowing cylinder, which greatly facilitated the manufacture of pig iron. Mr. Smeaton's cylindrical cast iron bellows, taking the place of the wooden or leather bellows, was used for the first time in connection with James Watt's improvements in the steam engine at the Carron Iron Works in Scotland, about 1769. The effect of the introduction of both of these improvements in blast furnace machinery was to greatly increase the blast and consequently to increase the production of iron. The blast, however, continued to be cold at all furnaces, both coke and charcoal, and so remained until 1828, when James Beaumont Neilson of Scotland invented the hot blast, which is now in general use.

LAKE GRAIN TARIFF FOR 1899.

In accordance with a meeting of lake underwriters held in New York, a short time ago, a full schedule of insurance rates on grain for the coming season has been issued in printed form. The lake vessels are divided into three classes and the rates proportioned according to class. In the first class are the regular line steamers not classing below A 2, and also all A 1 steamers of any value, as well as A 1½ steamers valued at \$40,000 or over. The second class includes all A 1½ steamers valued at \$25,000 and under \$40,000, and all A 1 tow barges valued at \$35,000 and upwards. In the third class are the lower grade vessels down to A 2 tow barges. There is no provision for insurance of grain in anything below A 2. The rates all represent material advances, and the difference in insuring grain in vessels of the first class as against those of the third is quite marked. During the summer months, for instance, the rate to Buffalo and other Lake Erie ports will be only 30 cents in vessels of the first class, as against 80 cents in those of the third class. Special high rates are made for April and for the fall months. Great Lakes Register classifications are recognized in the tariff, as it is provided that agents will be notified later on of the ratings in the new register that are equivalent to A 1, A 1½, etc., in Inland Lloyds.

The steamer Kaiser Wilhelm der Grosse recently broke the record from Cherbourg, traveling 3,148 knots with an average maintained speed of 22.33 knots. The day's runs were 416, 547, 549, 556, 556 and 524.

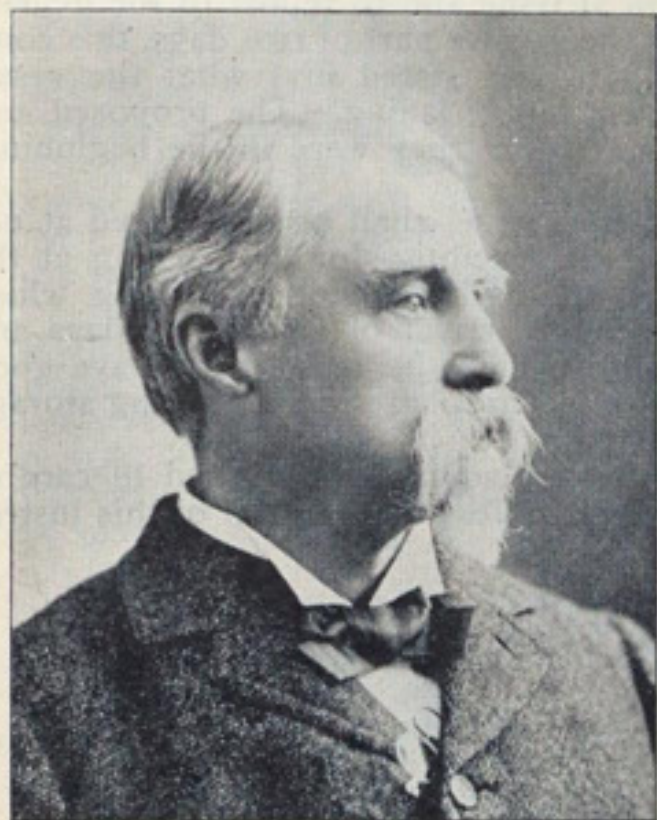


Triple Expansion Engines of Col. Oliver H. Payne's Yacht Aphrodite, Built by the Bath Iron Works, Bath, Me.—Most Powerful Engines Ever Installed in a Private Owned Pleasure Craft.

THE BATH IRON WORKS.

EXTENSIVE IMPROVEMENTS NOW UNDER WAY AT THE PRINCIPAL MAINE SHIP BUILDING PLANT—SOMETHING OF THE MEN INSTRUMENTAL IN THE ESTABLISHMENT OF THESE WORKS AND ALSO THE WORKS OF THE HYDE WINDLASS CO.

Everybody who is at all conversant with affairs in the ship building world knows how often and earnestly Gen. Thomas W. Hyde and the younger men of the same name in the Bath Iron Works have worked, not only for the upbuilding of their own establishment, but for the furtherance



GEN. T. W. HYDE.

of the best interests of the industry in general. This has not been better demonstrated than by the action of Gen. Hyde in insisting upon going to Washington, although his health was not of the best, at the time when the Hanna-Payne bill was under consideration. His arguments in favor of this measure were of a broad character, and were among the ablest and most convincing submitted to the senate committee having the bill under consideration.

In view of this spirit of general welfare shown by the Hydes in their relation to ship building interests, it would be only natural to suppose that they have been equally solicitous for everything pertaining to the city of Bath, where their ship building plant is located. The firm has long been famous for its manifestly

fair treatment of employes and it is pleasing to note that these latter and the townspeople generally are by no means laggard in expressions of material appreciation. This thought is induced by the announcement that General Thomas W. Hyde, president of the company, has been nominated for congress by the Republicans of Sagadahoc county, Maine, which takes in the city of Bath, and where a nomination is equivalent to an election, and that Charles E. Hyde, constructing engineer of the works, has been nominated for mayor of the city of Bath.

It may be noted in this connection also that work is going rapidly forward on improvements now in progress at the plant of the Bath company. Alterations and extensions, and the provision of new buildings, will in the aggregate prove more extensive than was at first contemplated, and although they will not approach the point of completion for several months, the operations have reached a stage sufficiently advanced to indicate, in some degree, the great advantage that will accrue from this enlargement of facilities. The building formerly occupied for general office purposes has been moved and is being replaced by a steel fire proof building. The old machine shop, a structure 82 by 215 feet in size, which has stood directly in the rear of the office building, will be replaced by a modern brick and steel fire proof structure 310 feet in length by 100 feet in width. This, moreover, marks only the opening of the era of improvement. Extensive purchases of new tools and machinery will also be made, it is understood, although the present equipment of the plant, from the 23-ton plate roller down, is very complete in every essential.

The work now on hand at the Bath yard exceeds in the aggregate that on the books of the company at any previous time. Steel vessels constructed to date at the Bath Iron Works include the United States gunboats Machias, Castine, Vicksburg and Newport; ram Katahdin of the United States navy; Norwich line steamer City of Lowell; steam yachts Eleanor, Peregrine and Illawarra; Maine Coast Navigation Co.'s steamer Salacia; light-ships Nos. 66, 68, 69 and 71; light-house tender Mayflower and the "tramp" steamer Winifred, recently built for Miller, Bull & Knowlton, New York. The work at present in hand includes the torpedo boats Dahlgren and Craven, which are practically completed and will have their trial trips this spring; the United States torpedo boats Bagley, Barney and Biddle, upon which work has not advanced very far; the United States training ship Chesapeake; the United States monitor Connecticut; a small private yacht, and Col. O. H. Payne's steel yacht Aphrodite, the largest steam yacht ever constructed in America, and in all probability the finest private pleasure craft in the world, as she will assuredly prove one of the speediest. This yacht, which is 303 feet in length, was designed throughout by Mr. Charles R. Hanscom, general superintendent of the Bath works.

The triple expansion engines of this vessel, which are herewith illustrated, are of special interest, inasmuch as they are the largest ever placed on board a private-owned pleasure craft. The cylinders are 28, 43 and



CHARLES R. HANSCOM.

70 inches in diameter respectively, and the stroke is 36 inches. There are four massive single-ended boilers. At natural draft these boilers will supply steam for 3200 I. H. P. There is no yacht afloat today that is fitted with machinery capable of developing this power at natural draft. The speed of the Aphrodite under steam alone, without forcing, will be at least 15 knots, and this she will be able to maintain on a long run, owing to her great boiler power and large coal capacity. Under forced draft she will make over 17 knots; indeed, she maintained practically that speed on the builder's trial a few days ago.

The Bath Iron works is very closely related to the Hyde Windlass Co., also of Bath. Officers of the Bath Iron Works are: Thomas W. Hyde, president; Edward W. Hyde, vice-president and treasurer; Charles R. Hanscom, general superintendent; John S. Hyde, superintendent engineering department; W. C. Besselièvre, assistant superintendent; J. P. L. Burke, purchasing agent. Officers of the Hyde Windlass Co. are: John S. Hyde, president; J. R. Andrews, general manager; E. W. Hyde, treasurer. Gen. Thomas W. Hyde is one of the most capable and influential men connected with the ship building industry in America. He served through the civil war with distinction, and in 1876 was elected president of the marine state senate. Since that time his business interests have required his entire attention. Just previous to the Spanish-American war Gen. Hyde made a trip to Cuba, and as a result of his faculty for close observation he is one of the best informed men in the country on the subject of existing conditions in the West Indies. Gen. Hyde is, of course, interested in the Hyde Windlass Co. as well as in the Bath Iron Works, although most of the cares of active management are now entrusted to his sons, John S. and Edward W. Hyde.

The Bath Iron Works gives employment to about 925 men, and the Hyde Windlass Co.'s force is about 165 men, the aggregate weekly pay roll being in the neighborhood of \$12,000. Contracts now on hand at the Bath works foot up close to \$2,500,000. A feature of the plants for both ship building and for the manufacture of windlasses is the extent to which electrical power is used. The foundry rooms of the windlass works are equipped with cranes that travel the entire length of the building, 282 feet. At the ship yard also there is a steel crane capable of lifting 100 tons.

An important contract upon which the Bath works has been engaged of late is in refitting as permanent troop ships several of the steamers used as army transports during the Spanish-American war. This work is done under arrangements with the war department at prices ranging from \$90,000 to \$135,000. The transport Grant, which has just arrived at Manilla, is an excellent example of the thorough manner in which the Bath company carried out the plans of the department engineers.

BUFFALO GRAIN ELEVATOR POOL.

Buffalo, March 14. The Buffalo elevators are in a struggle for existence still, with the chances now on the one side and now on the other. Meetings have been held every day and for the most part twice a day for some time. Until today, adjournment has been from day to day. Now it is at the call of the chair. There will be a long breath taken and then there will be another set-to. It need not be said any more plainly that the above indicates that the issue is a matter of entire doubt. Some days it is reported that more snags make their appearance than can be lopped off or sailed over and the effort comes out worse than it started in, but the latest report is that progress has been made. Of course it is all on account of the division of shares. So many of the owners are sure that some one else will give in first that they hold off to the last minute and ruin the whole undertaking unless they all happen to get scared at once; then there is likely to be an agreement.

This report of the situation is written intentionally in the interest of a pool of some sort. There is no branch of business at all contributory to the grain trade here that is not committed to the advocacy of a pool. Everybody believes that had there been one last season the business in Buffalo harbor would have been done better than it was. The minor elevators would have obtained more business and the congestion towards the end of the season would have been much less. Still, it has become such a habit to lay all transportation difficulties to the Buffalo elevator pool by people who are seeking for some excuse to misrepresent this interest, that even George W. Aldridge, the late beclouded superintendent of public works, put into his canal report the same stuff that his Rochester backers have used so freely that it has become a habit, and declared that elevator charges were to blame for the falling off in canal business last season. And the Buffalo elevators not earning money enough to pay their taxes! Still, outside ownership and railroad control have fairly driven the Buffalo elevator owner, who is a mere warehouseman, not interested in the grain he handles, to the wall.

Our canal boatmen are without any business in sight yet and say that they will not be offered any grain till the rail rates are fixed. With their usual hopefulness they are of the opinion that the rate by rail might as well be high enough this season to give them plenty of business as not. The roads are all practically in the Vanderbilt interest and the southern routes are cut out of part of their former differential. The canal fleet is so small that it cannot harm rail business if it does its utmost. Prospect of any special canal-improvement legislation is very small.

Iron ore business of Buffalo is not, of course, to be compared with grain, flour, etc., but it is a growing business, especially as regards the movement of Lake Superior ore east of the Alleghenies, and it is encouraging, therefore, to note that the business this year will be limited only by the dock facilities and the supply of cars from the railways. The Franklin iron works, near Utica, of which A. E. Hedstrom of Buffalo, is president, will go to making pig iron as soon as it can be started up. It has not been run for five years. The Buffalo furnace turns out 250 tons of pig iron a day, and Frank B. Baird hopes to get his new furnace plant ready to blow in not later than May. It will have a capacity of 200 tons. The Tonawanda and Punxsutawney furnaces of Rogers, Brown & Co. will run full time, though the greater part of our ore will, as usual, be shipped to the furnaces of eastern Pennsylvania.

The Bethlehem Iron Co., South Bethlehem, Pa., recently shipped to New York several line shafts for the American liner St. Louis. An innovation is found in flexible couplings with which the shafts are fitted.

ARMY TRANSPORTS.

GENERAL EFFICIENCY OF THE VESSELS RECENTLY REFITTED FOR SERVICE AS PERMANENT TROOP SHIPS BY THE WAR DEPARTMENT.

The initial steamers to be refitted as regular army transports at a cost of in the neighborhood of \$100,000 each have been renamed the Grant, Sherman and Sheridan. They are four-decked twin-screw steamers, built of steel and of 5,590 tons register. Each of the vessels is 445 feet keel, 455 feet over all, 49 feet beam, 34 feet depth, with 41 feet 6 inches depth to spar deck, and each has a draught of 26 feet on a dead load capacity of 7,270 tons.

In each vessel is installed two sets of triple expansion engines, with cylinders of 22½, 36½ and 60 inches diameter by 48 inches stroke, to which steam is supplied from two double-ended and two single-ended boilers, working at a pressure of 175 pounds. The capacity of the coal bunkers is 1,000 tons and the vessels will show an average coal consumption of 62 tons of coal per day. The speed of all three vessels is 12.25 knots. In each the capacity of the water tanks is 1,200 tons; the distilling capacity per day 35 tons; the ice storage 40 tons, and the refrigerating capacity (meat) 150 tons.

The ships are fitted to carry two full regiments of troops, amounting to 2,500 men, in addition to ship's officers and crew of 150, making a total of 2,650. The troops are berthed on the two lower decks. The mess room is on the main deck. A hospital with eighty beds is located on the after end of the main deck on each vessel, and is complete with dispensary surgeon's and steward's rooms, lavatories, etc. The accom-

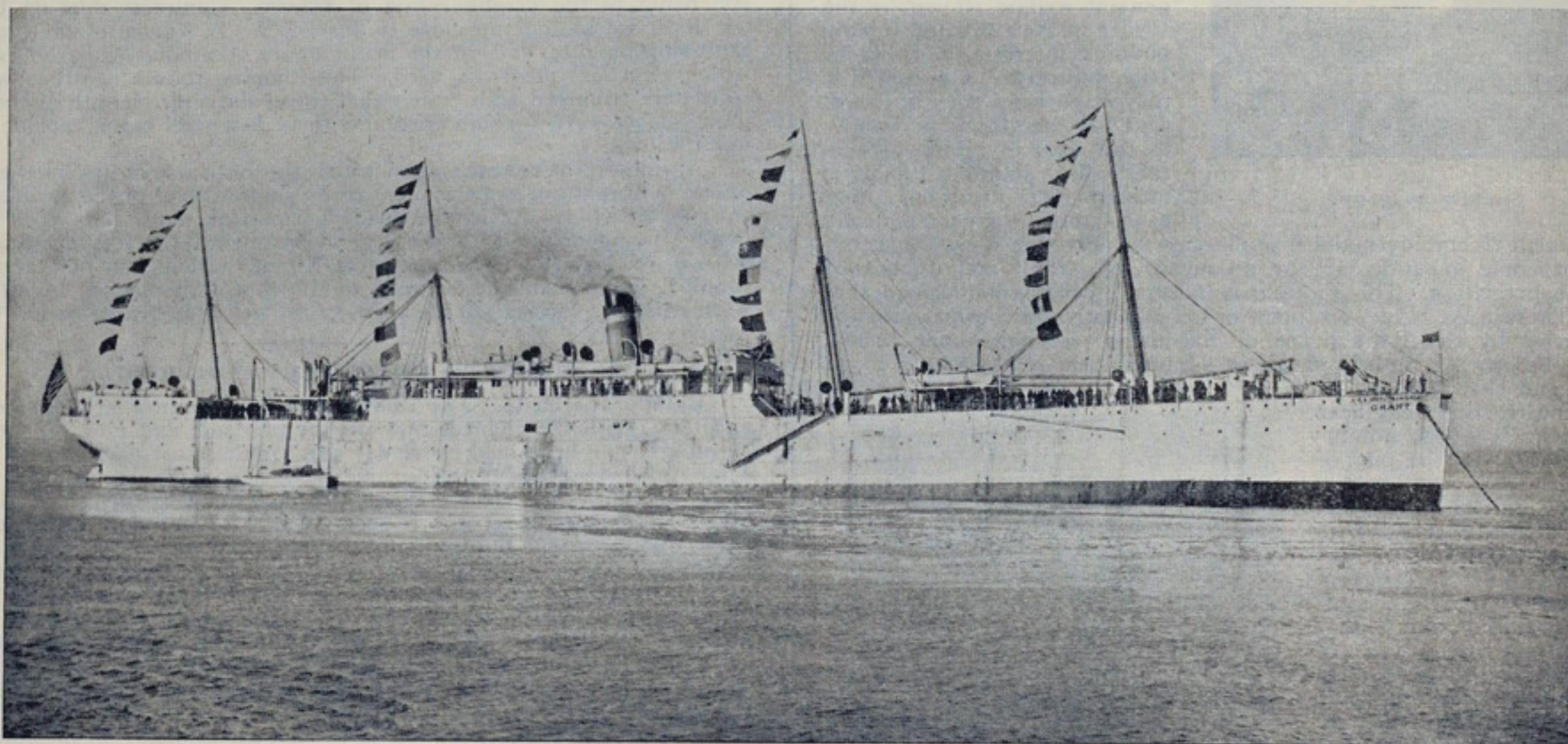
STILL IN THE SHIP OWNER'S HANDS.

THE QUESTION OF WHETHER HE IS STRONG ENOUGH TO CARRY OUT PROPOSED CHANGES IN THE GRAIN BILL OF LADING—THE BUFFALO CONFERENCE.

The last issue of the Marine Review contained an account of the efforts lake vessel owners in general conference with the grain interests at Buffalo to come to some conclusion regarding proposed changes in the grain bill of lading, that have been talked of since the last annual meeting of the Lake Carriers' Association in Detroit. It was noted that little progress was made in the general conference, and a committee of sixteen was therefore appointed, representing all the various interests in attendance, to consider the question at issue and to report to the general conference. After a session lasting the greater part of two days, this committee made a report, in which there was stated first what the vessel owners propose as changes in present bill of lading. The proposed new clauses, worked somewhat different to what they were in the beginning, are as follows:

"It is agreed that the cargo of this vessel shall be discharged at not more than two accessible elevators with facilities for discharging at the ordinary rate per hour of the port of discharge, for furnishing which twenty-four hours shall be allowed after arrival of vessel (Sundays and public holidays only excepted), failing which the vessel shall have good right to discharge into any elevator or elevators at the port having storage capacity and railroad connection."

"If the grain covered by this bill of lading is consigned in care of any person at destination of vessel then, unless the original of this instru-



United States Army Transport Grant, which has just arrived at Manila.

modations for the officers are to be found on the spar deck amidships, and on the bridge deck, and are complete with mess rooms, galley store, lavatories, etc.

The bakery is provided with electric kneading machines and the oven capacity aggregates 200 loaves of bread at a baking. The drinking water is furnished by a still and is supplied to troops cooled to any temperature desired by refrigerating machinery. Salt water shower baths are provided for the use of both officers and men. All parts of each ship are provided with mechanical ventilation, provision being made to heat or cool and clean the air before it is distributed through the vessel.

Eleven large life boats are provided, including two steam cutters 30 feet long; eight large life rafts and four life buoys. The ships are lighted throughout by electricity, and two search lights are provided. The electrical equipment also includes about thirty fans. The armament consists of four rapid-firing breech-loading six-pounders with a magazine having capacity for twenty-five tons of ammunition. Awnings are fitted the entire length of the vessels, together with side curtains, making the spar deck in all cases a pleasant promenade for the men, while the bridge deck serves in the same capacity for the officers. Every hatch is provided with a booby and stairs leading to all quarters below. The ships are painted white throughout, the inside work being enameled. The stack of each vessel has red, white and blue bands under a black top. All three of the transports mentioned are now on their way to Manila.

The Red Book, United States Standard Register of Shipping for 1899-1900, published at 16 and 18 Exchange place, New York, is at hand with the list of vessels and rules revised to date. This is the register for which Sinclair Stewart is surveyor and James W. Conklin secretary. The rules of this register, again revised and improved, certainly seem to be of a most practicable kind to work from. Especial attention is directed to the rules and tables for the construction of steel vessels. They are so clearly expressed and conveniently arranged that the scantlings of vessels of all sizes can be got at very readily.

It is understood that plans for the new cruisers, to be built in accordance with the last naval act, provide for triple-screw ships in which the power of the center engine will be considerably greater than that of the two side engines.

ment is there presented for cancellation, delivery to the person in whose care it is consigned herein shall be a good and valid delivery."

"The vessel shall be paid freight at the rate specified herein on the amount of said cargo actually delivered, without payment for overrun, and shall be liable for shortages not to exceed — of a bushel per 1000 bushels, which may be deducted from the freight at the current market price — but this limitation is without prejudice to claim for grain wet, damaged or actually lost by the vessel."

The committee of sixteen (grain interests and vessel interests), above referred to, made the following recommendations regarding the changes proposed by the vessel owners:

(a) That ten days be allowed the Buffalo trunk lines to determine and advise the Secretary of the Lake Carriers' Association what can be done to open the elevator facilities at the port of Buffalo to the lake vessels, thus avoiding the most serious delays of the class causing complaint in the season of 1898. Meantime the Lake Carriers' Association is to suspend action upon their proposed demurrage clause in the lake bill of lading.

(b) That the delays at ports of loading, due to the vessel being required to load at numerous elevators, be cared for by special contract between the lake vessel owner and the shipper; it being understood that the Lake Carriers' Association will advise its members to make such a contract with shippers when chartering their boats that vessels shall not be obliged to go to more than two elevators at point of loading, and that if obliged to go to more than two elevators to load, they shall be compensated for the extra expense.

(c) That cases of special hardships to vessels in delays that might have been reasonably prevented be referred to an arbitration board, to be provided for this service, the conclusions of such board to be binding on the parties in interest.

(d) That a proper clause be inserted in the lake bill of lading relieving vessels from liability when they have delivered "order" or other cargoes to the party in whose care they are consigned, and taken an agreed form of receipt upon such delivery.

(e) That all grain should be consigned to an individual consignee at port of lake delivery, and not to an elevator or a railroad company.

The representatives of the grain trade present presented the following

suggestion on the subject of shortages in grain cargoes, which was received and entered upon the minutes of the conference.

"As to grain shortages, we recommend, that no change be made in the bill of lading because of its possible effect on the collateral value of the document."

"We recognize the injustice there would be in requiring the vessel owner to pay for differences in elevator weights that do not represent an actual loss in transit, and recommend as the best method to protect the vessel owner against such injustice, a provision for submitting all such cases to arbitration, and for this purpose the merchants here present express it as their opinion that the members of the arbitration committees of their various commercial organizations will contribute their services in the amicable settlement of such cases as may arise, when so requested by the Lake Carriers' Association."

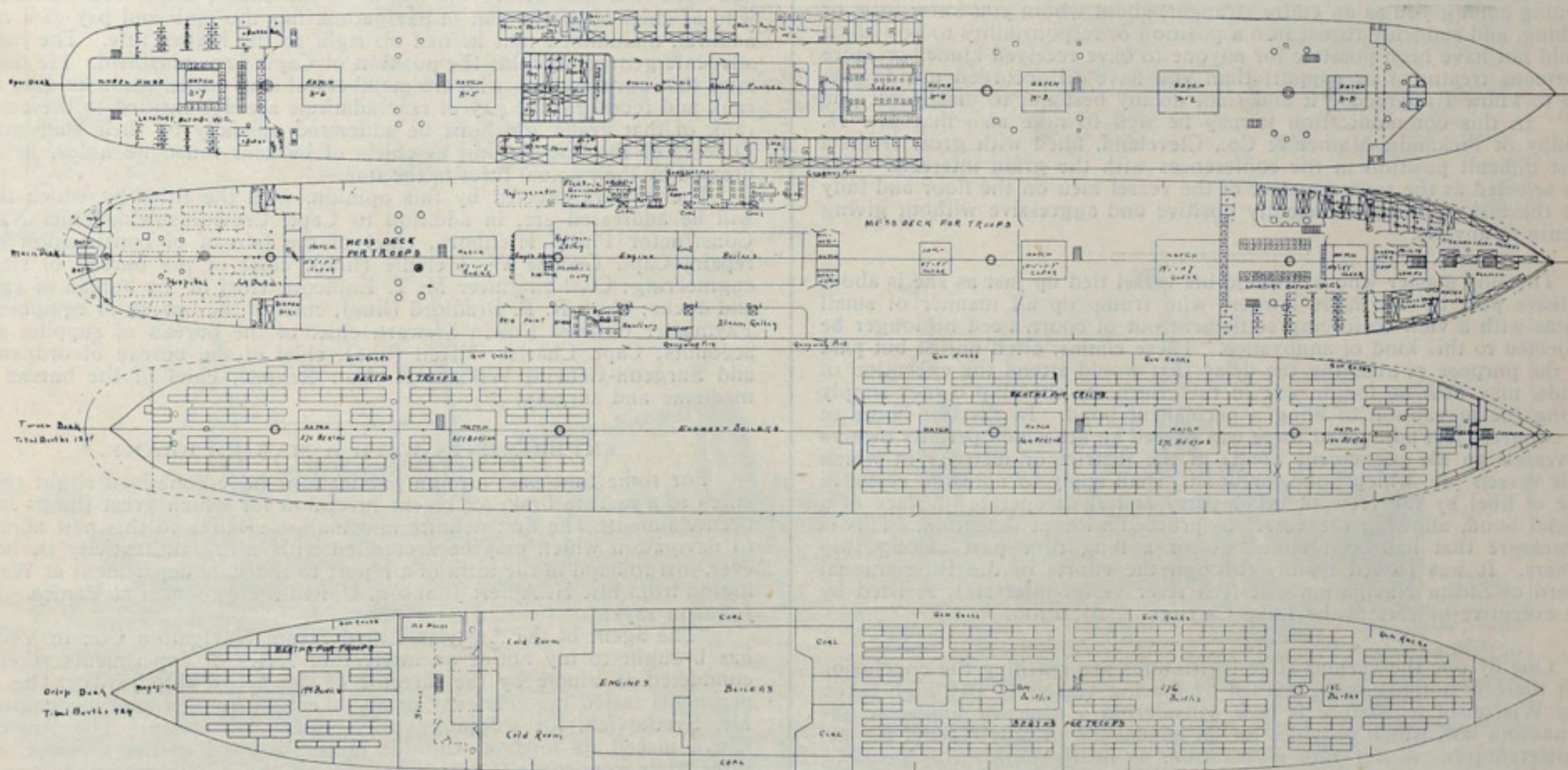
Thus the matter rests without definite action of any kind, but Secretary Keep of the Lake Carriers' Association has already submitted to the various organizations represented in the conference copies of the proposed bill of lading changes, as well as the foregoing report of the committee of sixteen, with the understanding that no action will be taken by the Lake Carriers' Association until April 1, by which time it is expected the various interests will again be heard from.

Reviewing generally the outcome of the Buffalo conference, one of the leaders on the vessel owners' side said: "It must be admitted that it was the sense of the conference that the vessel men had not been fairly dealt with, and that the abuses of which they complained should be corrected. The detention and delivery clauses were generally admitted to be fair, and there was no good reason advanced why such clauses should not be incorporated in the bill of lading. There was, however, considerable

GREAT LAKES REGISTER.

After two years of constant labor and an expenditure said to aggregate \$56,000, the Great Lakes Register (Royal Insurance building, Chicago), is in print, and will be ready for distribution to subscribers about the end of the present month. A few advance copies are already in the hands of the surveyors. The book is certainly the most complete work of its kind ever issued. The information in this register as to the character of vessels of the great lakes could not be more complete. It represents a labor far beyond the thoughts of anyone who has not had occasion to become acquainted with the work that has been going on in Chicago for two years past. The system of symbols is an admirable work, far beyond the efforts of the publishers of either Lloyd's Register or the Bureau Veritas. Whatever may be said of the so-called Prime-McCurdy syndicate by their competitors in insurance matters, or by vessel owners who may have disagreed with them in the insurance struggles of the past three or four years, they are certainly deserving of congratulation in having carried out such an undertaking as the publication of this book.

They now say positively that the register is to be in every sense of the term a corporation entirely removed from any part of their insurance affairs. Committees of prominent underwriters and vessel men to deal with rules and classifications have been selected and the names are certainly of a high order. The list includes: Charles Platt of Philadelphia, president Insurance Company of North America; Percy Chubb, Chubb & Sons, New York underwriters representing Sea Insurance Co., Limited, New York Marine Underwriters, Marine Insurance Co., Limited, and London Assurance Corporation; L. Allyn Wright of New York, British and Foreign Marine Insurance Co., Limited; Herbert Appleton, New York,



Deck Plans of the United States Army Transports.

opposition to the incorporation of the shortage clause, but the vessel representatives succeeded in establishing the fact that they had justice on their side, as will be seen by the reading of that part of the report put to the meeting by Mr. Passmore of Philadelphia, in which it is admitted that the injustice to the vessel owner in requiring him to pay for difference in elevator weights and measures which do not represent an actual loss incurred in transit, should be rectified. Whether this can be dealt with satisfactorily through an arbitration committee, as suggested in the report, will have to be decided by the executive committee of the Lake Carriers' Association. As the matter stands now, the other interests have been given an opportunity to canvass the subject among themselves, and to make any suggestions that they may deem proper in correcting the abuses of which the vessel men complain. While the vessel representatives endeavored to impress upon the conference the fact that they asked nothing but what was fair and proper, they still maintained the firm position that the Lake Carriers' Association intends to correct the evils, and that in the early days of April they would certainly make some changes in the present bill of lading. The fact that the conference admitted the justice of the position taken by the Lake Carriers' Association, demonstrates that the matter is now entirely in the hands of the vessel man to protect himself."

"I do not think it should be claimed," says a Buffalo vessel owner, "that the formation of an elevator pool now under way in Buffalo is due to the recent conference over the grain bill of lading. If the elevator men succeed in forming a pool they may claim that it was done with a view to overcoming delays to the vessels. A pool would certainly facilitate the unloading of ships, but the elevator managers are not burying their differences for love of the ships. A pool was talked of long before the conference on the bill of lading question, and it was generally understood that Mr. G. L. Douglas, representing the New York Central interests, had said the combination would go through. The pool was as good as formed when this statement was made by Mr. Douglas, as the New York Central support was all that was necessary to put through a combination when it was last tried."

United States Lloyds; Henry Haslam, London, Indemnity Mutual Marine Assurance Co., Limited; Chas. Counselman of Chas. Counselman & Co., grain merchants, Chicago; Geo. Spencer of Spencer, Moore & Co., grain merchants and elevator owners, Duluth; R. R. Rhodes, ship owner, Cleveland; L. C. Waldo and W. A. Livingstone, ship owners, Detroit; Thomas Cranage, ship owner, Bay City; Geo. E. Tener, ship owner, Pittsburgh.

The register, including all rules and other parts, will sell for \$25; the rules bound separately at \$5. It is understood, of course, that a class will not be given to any vessel in the book except upon application from the owner. This is, of course, the rule followed by classification societies throughout the world. The Inland Lloyd's Register of the great lakes has all along classed vessels without charge of any kind, and vessel men of the lakes have not been in the habit of paying for ratings placed upon their vessels, but in answer to this the publishers of the new book say that they dare not class any man's ship without his approval. Their's is a corporation operating simply for this purpose of ship classification. The Inland Lloyd's Register is a private book, the property of insurance agents. With a view to inducing vessel owners to apply for class in the register as rapidly as possible, it is announced that the following low charges will be made for certificates covering four years, if application is made on or before April 10: Vessels under 1,000 tons, 3 cents per gross ton; from 1,000 to 2,000 tons, 2½ cents; 2,000 to 3,000 tons, 2 cents; 3,000 tons and over, 1 cent.

Ten days stop-over at Washington—Tickets to Philadelphia and New York over Pennsylvania short lines may be obtained via Washington, and good for a ten days' visit at the national capital, at the same fare as apply to Philadelphia and New York over direct lines of Pennsylvania system. For further particulars apply to Pennsylvania lines ticket agents or address C. L. Kimball, passenger agent, Cleveland, O.

At a recent meeting of the Newport News Ship Building and Dry Dock Co. all the officers and directors were re-elected.

MARINE REVIEW

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When the grain interests and vessel men parted company in Buffalo a few days ago, after the several conferences over the grain bill of lading, the members of the Lake Carriers' Association were certainly disposed to shake hands with themselves over their recent good fortune in the selection of a president. In thanking the grain merchants and railway representatives on behalf of the vessel owners for their presence, Mr. H. Coulby of Cleveland said there was certainly one conclusion that was definite in his mind. If he was to take part in meetings of any kind in the future in which Mr. Frank J. Firth would be interested, he wanted him in the chair, but certainly not as an opponent on the floor. Mr. Firth appreciates the support that has been so heartily accorded him by the vessel men. In a letter to one of the members of the executive committee of the Lake Carriers' Association, reviewing briefly the Buffalo conference, he says: "I highly appreciate the kindly courtesy shown to me by all of my associates of the Lake Carriers' Association. Coming among you as an entire stranger, about whom you knew little or nothing, and suddenly thrust into a position of responsibility to you all, it would not have been possible for anyone to have received kinder or more courteous treatment or support than you have all accorded me. I want you to know I appreciate it and shall do my best not to disappoint you all." In this communication it may be well to note also that Mr. H. Coulby of Pickands, Mather & Co., Cleveland, filled with great credit a most difficult position in the conferences with the grain interests. He was selected as the representative of the vessel men on the floor and fully met the task of being sufficiently positive and aggressive without giving offense to anyone.

The ship master who has found his vessel tied up just as she is about to leave port by worthless lawyers who trump up all manner of small claims with a view to forcing settlement out of court, need no longer be subjected to this kind of annoyance. These claims, often unjust but paid for the purpose of avoiding the delay that would attend the execution of bonds, may now be fought out in the courts by the ship owner simply taking the precaution of filing a permanent bond. In the last hours of the congress just adjourned there was passed an act which permits owners of vessels to file permanent bonds in the district or districts in which their vessels ply, which bond, or bonds, shall apply to hold the vessel in case of libel by the crew or other party and shall operate in place of a special bond, allowing the vessel to proceed without detention. This is a measure that has been talked of for a long time past among ship owners. It was passed mainly through the efforts of the International Board of Steam Navigation (western river vessel interests), assisted by the executive officers of the Lake Carriers' Association.

One by one the various state legislatures are reaching the conclusion that there is nothing to be gained by forcing vessels to pay high taxes. The Wisconsin legislature is now considering a measure similar to the Minnesota law, which provides for an annual tax of only 3 cents per net registered ton. A fair rate of taxation, as nearly uniform as possible, should be adopted by all the states throughout the country, especially for vessels in the coasting trade. Some difficulties may be encountered in the matter of changing laws so as to bring this about, but if it is not done the ship will be listed for taxation where the rate is fair. There is little difficulty in changing, from a legal standpoint, the ship's place of residence. In the city of Cleveland, for instance, the tax duplicate contained, a few years ago, millions of dollars of vessel property. At present the amount of vessel property listed in Cleveland is less than half a million. The ships were charged with school taxes, sewer taxes and all manner of taxes, but a way was found in which they could be removed from the Cleveland district, and there is little hope now of ever inducing them to return.

Vessel men of the great lakes who had thought of organizing a company in New York or Boston for the management of barges that were chartered by the Atlantic Transportation Co., but afterward given up on account of the failure of that company and left at points on the St. Lawrence and in Nova Scotia, have concluded, after looking over the ground, that they have had enough of the seaboard business. It is not at all probable that Capt. John Mitchell of Cleveland or Capt. Ben. Boutell, who had a scheme of this kind under consideration, will follow up their plans on this score. The operation of barges with high towing charges in the Newport News—New York trade is a doubtful proposition for anyone who is without coal shipping connections, notwithstanding the high freights now prevailing, but these gentlemen say that steel steam vessels of full Welland canal size, such as the boat building for Miller, Bull & Knowlton of New York at the Craig yard in Toledo, are certain of a profitable business running from New York to Cuba and South American ports.

President McKinley will very probably put off the appointment of the new commission to investigate the Nicaragua and Panama canal routes, in accordance with provisions of the last river and harbor act, until the commission headed by Admiral Walker has submitted its report, which will be about the middle of April. It is quite probable also that instead of appointing an entirely new commission, the president will delegate the work to the Walker commission, which will be increased in number.

NAVY BUREAU CHIEFS.

JUDGE ADVOCATE GENERAL LEMLY RENDERS AN OPINION ON THE SUBJECT OF TITLES BY WHICH THEY SHOULD BE ADDRESSED.

Capt. S. C. Lemly, judge advocate general of the navy, has rendered an opinion, which has been indorsed by the department, on a point raised by Capt. Crowninshield, chief of the bureau of navigation, to determine the question of whether staff officers of the navy should have the title of rear admiral while serving as chiefs of naval bureaus. Under the old law chiefs of bureaus had the relative but not the positive rank of commodore. Their titles were those which they held in the branch of the service to which they belonged, as engineer-in-chief, chief naval constructor and paymaster-general. Under the act for the reorganization of the personnel of the navy, which became a law on March 3, it was provided that "when the office of chief of bureau is filled by an officer below the rank of rear admiral, said officer shall, while holding said office, have the rank of rear admiral." The previous law had contained the word "relative" before the word "rank." It was provided also in the new law that "all sections of the revised statutes which, in defining the rank of officers or positions in the navy, contain the words 'the relative rank of' are hereby amended so as to read 'the rank of,' but officers whose rank is so defined shall not be entitled by virtue of their rank to command in the line or other staff corps; neither shall this act be construed as changing the titles of officers in the staff corps of the navy."

The question was raised by Capt. Crowninshield, because the department, in addressing letters to all the bureau chiefs, notifying them that under the new law they would receive the rank and pay of rear admirals, had used that title before the names of the chiefs, Capt. Crowninshield, who as chief of the bureau of navigation, has the rank and pay of a rear admiral, maintained that he had no right to the higher title. The judge advocate general upholds the position of Capt. Crowninshield. He maintains that bureau chiefs who are members of staff corps, while holding the rank and receiving the pay of rear admirals are not entitled to the actual rank of that grade and must be addressed officially by their staff titles. Officers of the line serving as chiefs of bureaus must, he holds, be addressed by their actual titles in the line.

The officers affected by this opinion, with the titles by which they will be addressed are, in addition to Capt. Crowninshield, Chief Naval Constructor Philip Hichborn, chief of the bureau of construction and repair; Capt. George W. Melville (line), chief of the bureau of steam engineering; Civil Engineer M. T. Endicott, chief of the bureau of yards and docks; Capt. R. B. Bradford (line), chief of the bureau of equipment; Paymaster General Edwin Stewart, chief of the bureau of supplies and accounts; Capt. Charles O'Neil (line), chief of the bureau of ordnance, and Surgeon-General William K. Van Reypen, chief of the bureau of medicine and surgery.

EXPERIMENTS WITH A MARINE BRAKE.

For some time past foreign publications have contained slight references to a marine brake of recent invention for which great things have been claimed. The first definite information relative to this new adjunct to navigation which may be accredited with entire authenticity is, however, just to hand in the form of a report to the state department at Washington from Mr. H. Albert Johnson, United States consul at Venice. Mr. Johnson says:

"The agent of the Austrian Lloyd Steam Navigation Co., in Venice has brought to my notice an interesting series of experiments recently conducted at Fiume by the director of the Lloyd ship yards. The experiments tested the efficiency of an invention by a Hungarian engineer Mr. Svetkovich, for stopping vessels under full steam. The Austrian Lloyd placed its towboat Clotilde at the disposal of the inventor, and three trials were made to test the invention under different conditions.

"This marine brake is a sort of parachute of fine spring-steel plates which, when out of use, fit into one another and hang above water. For the first trial, the apparatus was attached to the stern of the Clotilde, and the steamer put on full steam. When maximum speed was attained—in Austrian reckoning, 9 miles per hour—the retaining hook was released, and the parachute plunged into the water. With a scarcely perceptible shock the vessel came to a standstill in 30 feet. It was found, however, that the rods and guys supporting the brake were badly strained. If they had not yielded, the shock would have been much more severe. The fact that the supports did yield did not argue seriously against the efficiency of the brake, but was attributed to the provisional character of the arrangements. The second trial was designed to show how far the vessel would proceed when her engines were stopped at full speed, no brake being used. The distance was found to be 300 yards. The third trial measured the forward movement when the engines were reversed from full speed astern. This time the Clotilde stopped in 60 yards.

"While the second and third trials were in progress, the marine brake was refitted with more powerful supports, and a fresh experiment was made. This time the vessel stopped almost instantly. These results while hardly to be considered valid for the powerful ocean liners, with which the necessity for a quick stop is occasionally so crucial, indicate that an important principle has been introduced among marine safeguards. The Austrian Lloyd Co. is awaiting with interest the results of an improvement which Mr. Svetkovich wishes to add to his device, and seriously contemplates equipping its great fleet with the useful apparatus."

The Consolidated Elevator Co. of Duluth has let to the Barnett & Record Co. of Minneapolis a contract for an addition to its elevator "E" of 500,000 bushels capacity. The contract includes a 1,000 horse power engine. The price is supposed to be about \$120,000, the work to be completed by July. Both the Globe and Great Northern elevator companies, with a combined capacity of about 8,000,000 bushels, have notified customers they can take in no more grain, the capacity being exhausted.

Messrs. Miller, Bull & Knowlton, agents of the New York & Porto Rico Line, will remove on or about March 20 from their Pearl street offices to new and larger quarters at No. 32 Broadway.

SIGNALS FROM DECK TO ENGINE ROOM.

Following a meeting in Cleveland on Tuesday last of engineers in the employ of Pickands, Mather & Co., representing the largest fleet of ships on the great lakes, the following letter, which is self explanatory, was sent to the chief of the steamboat inspection service. An answer to this letter will be awaited with a great deal of interest by everybody connected with the management of lake vessels:

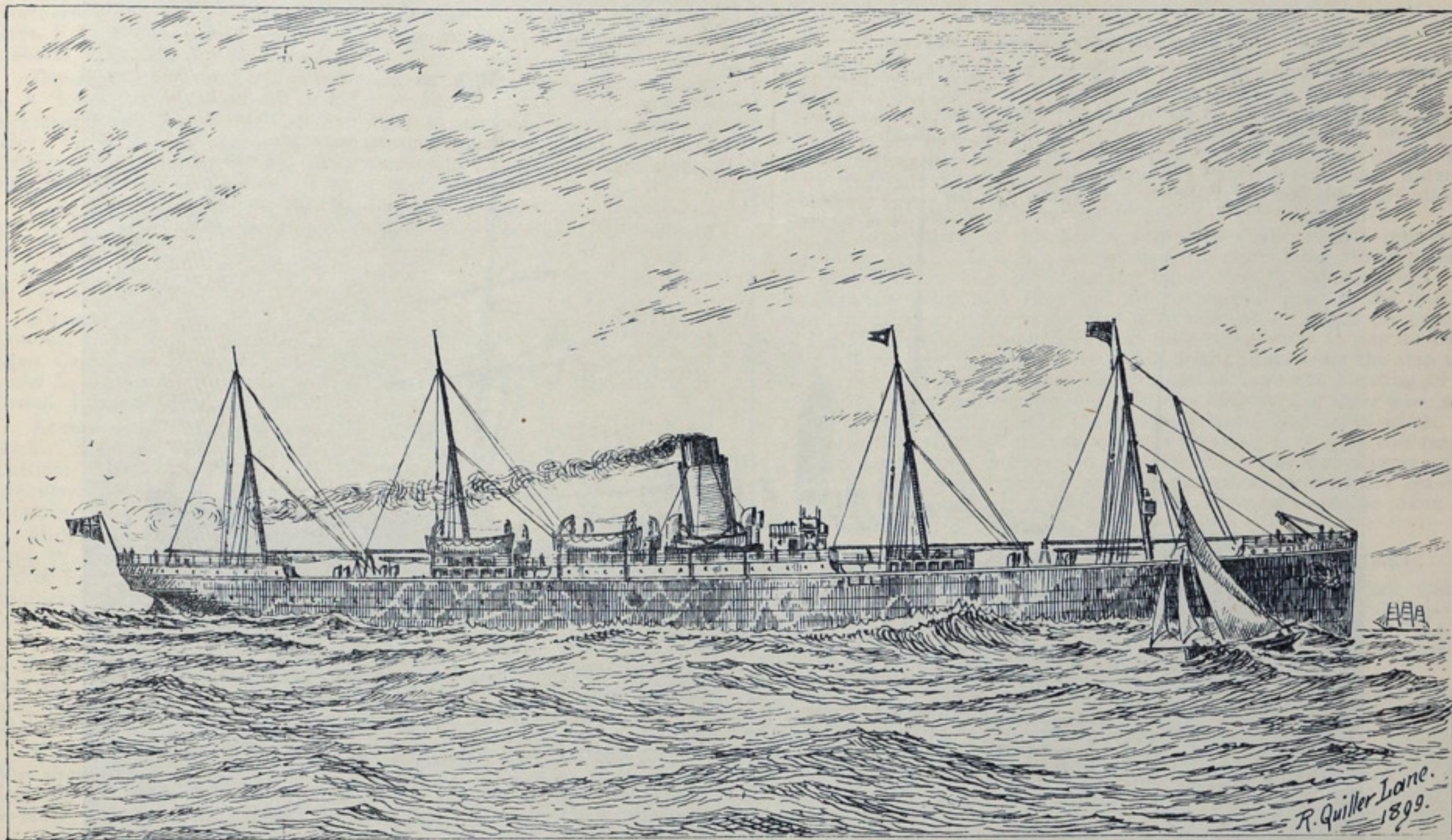
Jas. A. Dumont, Supervising Inspector General of Steam Vessels, Washington, D. C.—Dear Sir: We had a conference today with the chief engineers of our combined fleets, numbering twenty-four steamers. Among other things brought up for discussion was the rule relating to the whistle signals between pilots and engineers on lake vessels. We understand it has become the universal custom when the master desires the engine to back strong to repeat the backing signal of two whistles. One of our engineers advised us this is contrary to your ruling, as he understands you have stated that when the two-whistle signal is received it can only be interpreted to mean "reverse your engine and work her in the opposite direction," and that in event of the master desiring the engine worked stronger he must, irrespective of whether she is going ahead or backing, use the one-whistle signal.

You are, of course, thoroughly conversant with all the arguments that have been advanced for and against this ruling. We simply ask if you will kindly write us confirming the above statement, if it is correct, so that we may issue circular letters to the masters and engineers in charge of our boats. We would like to add, however, that the experience of our

an empty space between. The construction of the boiler proper has not been modified in the new type. It still consists of removable tube sections accessible from the front with feed and steam collectors and down-cast pipes connecting the two. The tube sections, however, contain fewer rows of tubes than hitherto. The economiser consists of tube sections similar to those in the generator but made of smaller tubes. The combustion gases heat the water on its way through the economiser before it is fed into the generator. The space between the generator and economiser tubes receives the combustion gases, which, thoroughly mixed by suitably arranged air jets, take fire if their temperature and composition permit. This re-ignition is no longer an objectionable feature, it is claimed, but is, on the contrary, encouraged if possible. On leaving the combustion chamber the gases pass through the economiser, namely, the sections of small tubes, losing sufficient heat by contact with them to render re-ignition in the chimney impossible, even under the most favorable conditions. Numerous plates are used to illustrate this new type of Belleville boiler and the trials of it.

TWIN-SCREW STEAMER AFRIC.

The latest methods of construction in modern cargo carriers are exemplified in the steamer *Afric*, which has just been completed by Harland & Wolff at Belfast, Ireland, for the White Star line. It is understood that the *Afric* will be in service between New York and Liverpool for twelve months and will then be put on the New Zealand line from London. The *Afric* is 550 feet in length, 63 feet beam, 44 feet depth and of 12,000 gross



THE AFRIC, RECENTLY BUILT BY HARLAND & WOLFF, BELFAST, IRELAND, FOR THE WHITE STAR LINE.

men seems to have been that under this ruling there is liable to be more mistakes between the master and engineer than there would be under the custom which they have been following. Under the interpretation heretofore given to this rule the two-whistle signal had simply one meaning, which was to back the engine, and a repetition was to back the engine strong. By your ruling two meanings are given to this signal. It often times happens that the captain, having to use a good many whistle signals in docking his ship, may possibly forget the last signal given to his engineer, and they have guarded against this by only giving the two-whistle signal one interpretation.

PICKANDS, MATHER & CO.

Cleveland, March 14, 1899.

IMPROVEMENTS IN THE BELLEVILLE BOILER.

Mr. Miers, engineer of 21 East Twenty-first street, New York, who has for several years been associated with Messrs. Delaunay, Belleville & Co. of France, manufacturers of the Belleville water tube boiler, recently issued in pamphlet form a translation of an important paper on this type of boiler, read some time ago before the Association Technique Maritime by M. Godard, technical manager for the French firm. The paper describes recent improvements in the design of the Belleville boiler and gives results of trials following these improvements. Opponents of water tube boilers have claimed that they are inferior to the cylindrical boiler on the score of decreased economy, especially when forced, and on account also of flaming of combustion gases in the uptakes and chimneys when the quality of coal is bad, the firemen inexperienced or the draft insufficient. These defects can not be charged, M. Godard says, against the new type of Belleville boiler with combustion chamber and economizer. It is this new type of Belleville generator that is dealt with in the paper. The essential difference between the old and the new type consists in the separation of tube sections into two parts, leaving

tons register, with a displacement of 20,000 tons. She is fitted with twin screws and two sets of tri-compound engines. Although intended mainly as a cargo and cattle carrier, this vessel has some passenger accommodations, and all known improvements have been utilized in her equipment. The drawing herewith presented was made especially for the Review by R. Quiller-Lane, the English artist.

Mr. A. Osier, western representative of Degrauw, Aymar & Co., 34 South street, New York, directs the attention of the Review to the following note in a recent issue of the "Commercial & Financial World:" "Amongst recent notices of incorporation of new companies is one to the effect that there has been formed a company under the style of Degrauw, Aymar & Co., for the purpose of carrying on business as wholesale dealers in rope, cordage, oakum, wire rope, chains, etc., and a great many people have very naturally come to the conclusion that this was the incorporation of the old concern of that name located at Nos. 34 and 35 South street, New York, and of which Mr. Geo. F. Schmid has been for some time past the sole proprietor, but such, it appears, is not the case. The old house of Degrauw, Aymar & Co. dates back to 1829, just seventy years ago, and during that long period there have been, of course, various changes of style and personnel, and the present one has been in use since 1881. For about four years past Mr. Schmid has been sole owner of the business and has carried it on under the old firm style, retaining, of course, all the old connections. The new company recently established is formed by former employees of this house. In view of the similarity of names, it is proper to print these details, so that customers of the old house may know that its business is being carried on just as heretofore and under precisely the same management. There will be and has been no change in the house of Degrauw, Aymar & Co., and the trade should see to it that they send their letters and orders to the right address, 34 and 35 South street, New York."

THE ACCIDENT TO THE PAVONIA.

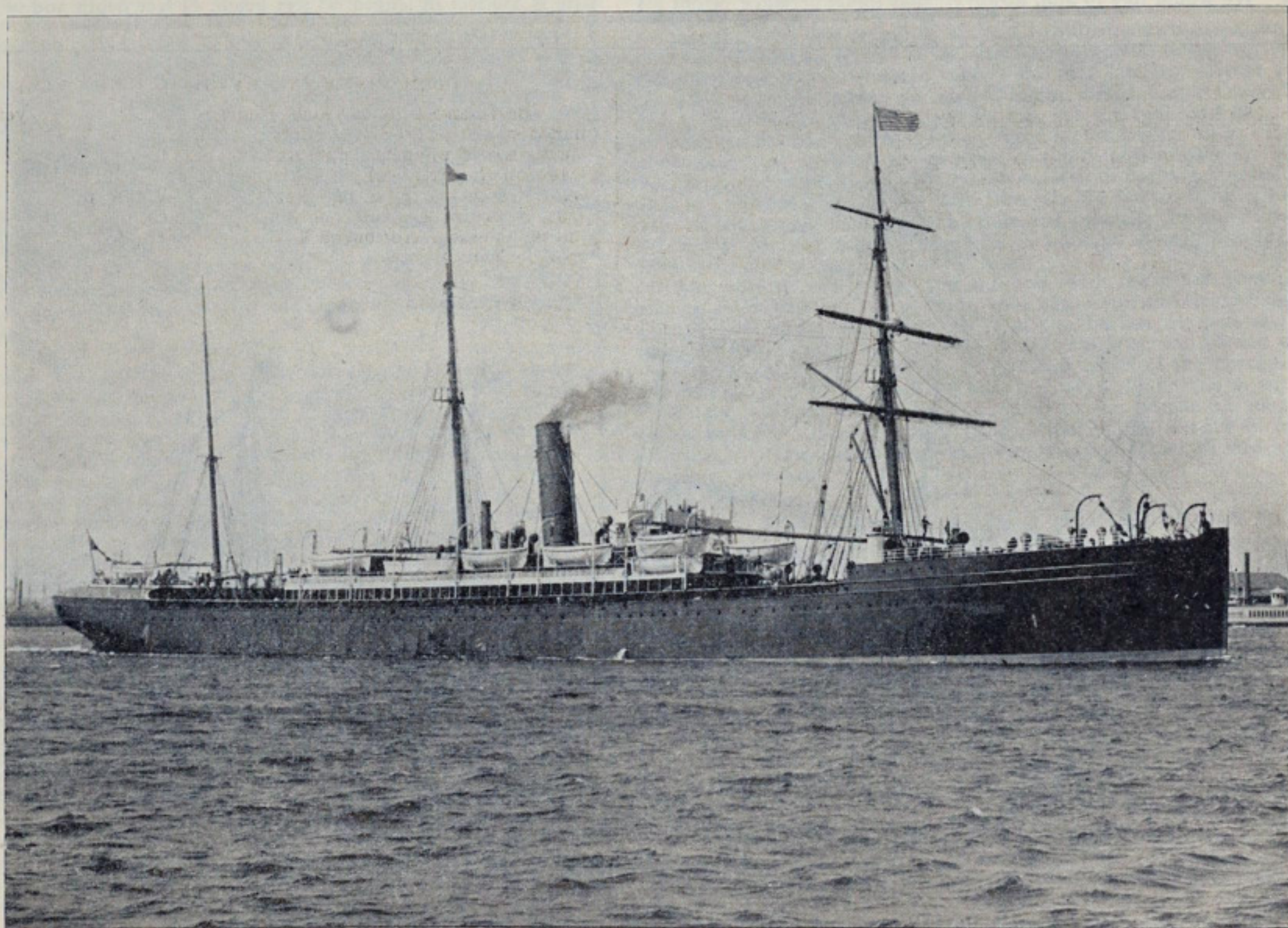
The Review is enabled to present herewith a picture made from a recent photo of the Cunard line steamer Pavonia, which became disabled and had to be towed into the Azores. The accident is to be made the subject of a very full investigation, and is likely to eventually prove famous. Coupled with the announcement that the whole circumstances of the steamer's breakdown will be investigated in due course of time, the officials of the Cunard line denounce in the most forcible manner the charges of cowardice against Capt. Atkins and Chief Engineer Duncan by the passengers of the Pavonia, who reached New York on March 7 by the Portuguese steamer Vega from Ponta del Gada, Azores islands. Officials of the steamship company say that since the arrival of the Pavonia at Liverpool, where her appearance was the signal for a great demonstration, sufficient details regarding the breakdown have been transmitted to them to justify them in making the denial alluded to above. It is generally understood that the breakdown was due to a defect in the boilers, although its exact nature has not been made public. A feature of the case which will probably cause almost as much comment as the main circumstances, is the unsuccessful attempt of the steamer Colorado to tow the disabled steamer, which she picked up in helpless condition. Reports agree, of course, that a very high sea was running, but advocates of automatic towing machines, such as that manufactured by the American Ship Windlass Co., are making the claim that this unfortunate feature

LAUNCH OF THE NANTUCKET.

SECOND OF THE HANDSOME VESSELS BUILDING FOR THE MERCHANTS' & MINERS' TRANSPORTATION CO. SLIDES INTO THE WATER AT THE YARD OF THE HARLAN & HOLLINGSWORTH CO.

The Harlan & Hollingsworth Co. of Wilmington, Del., announce that they will launch today (Thursday) the steamer Nantucket for the Merchants' and Miners' Trans. Co. of Baltimore, being the eleventh vessel built for this company. The Nantucket is 294 feet long, 42 feet beam and 34 feet depth of hold. The engine is tri-compound, with inverted cylinders, 28 inches high pressure; intermediate 45 inches; low pressure 75 inches; stroke 54 inches. There are four cylindrical, return-tubular boilers—diameter of shell 14½ feet; length inside 12 feet; three furnaces in each leading to separate combustion chambers; diameter of furnaces about 50 inches outside; grate surface about 320 square feet; heating surface about 10,160 square feet; pressure 170 lbs. per square inch.

This vessel is a four full-decked ship, with two cargo ports, two coal ports on each side in second between decks, and three cargo ports and one air port opposite to kitchen on each side on the third between decks. On the third deck there is a passenger saloon with twenty state rooms, pantry and toilet, fitted in light hardwood and having large open double stairway. The main saloon is about 72 feet long and 30 feet wide. The kitchen and second class rooms, cooks' and wash rooms are on third



CUNARD LINER PAVONIA WHICH RECENTLY BROKE DOWN AT SEA.

of the present accident constitutes a most powerful argument for the general equipment of ocean liners with machines of this kind. The Pavonia was built in Glasgow in 1882. She is 430 feet in length, 46 feet beam, 34 feet 9 inches depth and of 3,490 net or 5,588 gross tons burden. She is fitted with two-cylinder compound engines—cylinders 52 and 93 inches diameter by 66 inches stroke, and of 700 horse power. The steamer upon her arrival at Liverpool presented a very battered appearance, her rails being carried away or twisted and her topmast gone.

FACTS VS. PREJUDICE.

Some weeks ago the Cunard steamer Pavonia became disabled through defect in her boilers and was drifting helplessly when overhauled by the steamer Colorado, which took the disabled vessel in tow, but the hawser soon broke and the vessels lost sight of each other during a hurricane. Later the Pavonia reached port in safety. Contrast this failure to successfully tow a vessel with the record of a steamer provided with a towing machine, making headway through the terrible storms that prevailed on the Atlantic coast last November and towing several large barges, coal laden to destination! The entire record of this machine is free from a single instance of a line parting, while hardly a dangerous tow has been undertaken without this aid that has not a record of one or more lines parting before the work was finished. Such practical illustrations of the value of the Shaw & Spiegel towing machine, manufactured by the American Ship Windlass Co., Providence, R. I., should bring all owners of steam vessels to adopt the device. The United States Navy Department months ago (and government bureaus are not quick to act) adopted the towing machine.—Daily Commercial News, San Francisco.

deck. On this deck there is also a forecabin, with proper accommodations for stores, ice, oil, lamp rooms, etc. On the spar deck abaft the smoke stack there is a house containing engine room opening, engineer's room, social hall, toilet rooms, passengers' state rooms, etc. Surrounding the smoke stack is a house containing smoking rooms, toilet and officers' rooms, etc. Forward of the smoke stack will be a house containing ten state rooms for passengers. On top of this house is a pilot house. The vessel is schooner rigged, having two pole masts with wire standing rigging. All state rooms are finished in hard wood. The vessel is fully equipped with an outfit of Blake pumps.

At the same time that the Nantucket is launched, her sister ship, the Kershaw will have a dock trial of her engines. She will be turned over to her owners this month. Work on the several vessels in this yard is progressing rapidly. A new plate and angle furnace, 60 by 150 feet, is being laid down and piles are being driven for a new wharf. The keel is laid and centre keelson up of the torpedo boat destroyers Hopkins and Hull. Early in the spring the 30-knot torpedo boat destroyer Stringham will be launched. Although the government has given seven months extension on this vessel, she will probably be completed before that time. The 335-foot steamer Ponce for the New York and Porto Rico Steamship Co. has her water bottoms up and margin plates in place and the workmen have begun the framing. Immediately the Nantucket is launched, the San Juan, sister ship of the Ponce, will be laid down on the ways. The steamer Maracaibo for the Red D Line has her keel laid with stem in place, and frames are going up. These three latter ships are being built under the supervision of Mr. John Haug. The new ship for the Windsor Line, fourth vessel for that company, which is being built under the supervision of Mr. C. W. Wiley, will be laid down next week. New ways built for this vessel are already lined up.

APPOINTMENT OF MASTERS AND ENGINEERS.

Wilson Transit Co., Cleveland: Steamers—New Boat Building, Capt. W. W. Dawley, Engineer Fred M. Harman; Andrew Carnegie, Capt. C. C. Tousley, Engineer Wm. F. Gregory; W. D. Rees, Capt. Charles A. Benham, Engineer Frank Stoeber; Yuma, Capt. Daniel Buie, Engineer John Skelly; Spokane, Capt. Wm. H. Williams, Engineer James F. Derrig; Olympia, Capt. A. M. Shephard, Engineer James H. Norton; Yakima, Capt. Wm. P. Benham, Engineer James McGuirk; Sitka, Capt. Alex. Forbes, Engineer John F. Walsh; C. Tower, Jr., Capt. Geo. B. Brock, Engineer Peter LaMarr; Wallula, Capt. Geo. W. Bryce, Engineer Jacob Zeh. Schooners—D. Z. Norton, Capt. James Higgins; Yukon, Capt. Wm. Forbes.

Jones & Co., C. R., Cleveland: Steamers—Argo, Capt. Geo. L. Cottrell, Engineer John Golden; Rhoda Emily, Capt. Jos. Albano, Engineer Ambrose Smith; W. L. Wetmore, Capt. C. M. Ennes, Engineer F. Stevenson; Desmond, Capt. L. F. Hunt, Engineer G. P. Hendry; A. G. Lindsay, Capt. C. H. Woodford, Engineer Chas. Burns; Argonaut, Capt. J. H. Warwick, Engineer —. Schooners—Brunette, Capt. Geo. R. Bonnah; Hattie, Capt. —; Chas. Wall, Capt. —; John Magee, Capt. Harry May; John T. Mott, Capt. J. M. Jones; Canton, Capt. H. Jeffery; Delos De Wolf, Capt. A. Carter.

Northern Steamship Co., Buffalo: Steamers—North West, Capt. G. A. Minar, Engineer R. S. Grant; North Land, Capt. W. C. Brown, Engineer John L. MacVicar; Northern King, Capt. J. M. Saunders, Engineer John O'Mara; Northern Queen, Capt. J. F. Vaughn, Engineer A. T. Stewart; North Wind, Capt. Delos Waite, Engineer Thos. Jackman; Northern Wave, Capt. Martin Niland, Engineer J. J. Darcy; North Star, Capt. F. G. Stewart, Engineer W. T. Pike; Northern Light, Capt. M. J. Haberer, Engineer Frank Harringer.

Cleveland Cliffs Iron Co., Cleveland, O.: Steamers—Pontiac, Capt. S. A. Lyons, Engineer T. B. Kelley; Frontenac, Capt. S. N. Murphy, Engineer E. V. Barry; Cadillac, Capt. Geo. A. Symes, Engineer Thos. J. Rees; Pioneer, Capt. John M. Johnston, Engineer John J. Sammon; Kaliyuga, Capt. G. D. Tulian, Engineer James Bennett. Schooner—Fontana, Capt. A. C. Reimers.

Lake Erie Trans. Co., A. W. Colton, Mgr., Toledo, O.: Steamers—S. C. Reynolds, Capt. Henry Root, Engineer James Miller; Geo. J. Gould, Capt. Walter M. Cottrell, Engineer Geo. A. Butler; Russell Sage, Capt. T. C. Herrick, Engineer Joseph Kohlbrenner; John C. Gault, Capt. Chas. H. Lewis, Engineer John C. Bustead.

Fitzgerald & Co., R. P., Milwaukee, Wis.: Steamers—Phillip D. Armour, Capt. F. D. Chamberlin, Engineer Frank Keating; Wiley M. Egan, Capt. Fred Howe, Engineer Fred Coleman; R. P. Fitzgerald, Capt. Leslie E. Boyce, Engineer B. McNeill; John Plankinton, Capt. Lewis H. Powell, Engineer Wm. G. Fell.

Arnold Line Steamers, Geo. T. Arnold, Mgr., Mackinaw Island, Mich.: Steamers—Ossifrage, Capt. Wm. McCarty, Engineer Patrick Eustice; Minnie M., Capt. J. B. Mondor, Engineer Michael Madden; Islander, Capt. —, Engineer Wm. Porter; Edna, Capt. Chas. Mosier, Engineer D. Elliott.

McKay R. O. & A. B., Hamilton, Ont.: Steamers—Sir S. L. Tilley, Capt. W. O. Zealand, Engineer Joseph Boulanger; Lake Michigan, Capt. Arthur Lefebvre, Engineer Joseph Dawson; Myles, Capt. John S. Moore, Engineer Jas. Smeaton. Schooner—T. R. Merritt, Capt. William A. Corson.

Corning, Gurdon, Saginaw, E. S., Mich.: Steamers—Oscoda, Capt. G. W. Ryan, Engineer Frank Nold; C. H. Green, Capt. C. E. Little, Engineer Wm. Ormsby. Schooners—Our Son, Capt. Peter Edgar; Genoa, Capt. D. C. Ryan; Ida Corning, Capt. Peter H. Edgar; C. G. King, Capt. Michael Ryan.

Mutual Transportation Co., Cleveland: Steamers—Coralina, Capt. Wm. Cumming, Engineer Chas. J. Love; Cambria, Capt. Martin Johnson, Engineer Fred. Warning; Corsica, Capt. Jas. A. Walsh, Engineer Andrew G. Haig; Corona, Capt. Stephen Murphy, Engineer Grant Donaldson.

Ann Arbor Railroad & Steamship Lines, Toledo, O.: Steam Ferries—Ann Arbor No. 1, Capt. J. C. Ackerman, Engineer A. W. Ackerman; Ann Arbor No. 2, Capt. W. E. Clark, Engineer W. L. Campbell; Ann Arbor No. 3, Capt. J. M. Twichry, Engineer T. H. Cosgrove.

Mackinac Trans. Co., Capt. L. R. Boynton, Mgr., St. Ignace, Mich.: Steamers—Sainte Marie, Capt. L. R. Boynton, Engineer Richard Walsh; Saint Ignace, Capt. —, Engineer H. T. O'Brien.

Shores, E. A., Ashland, Wis.: Steamer—J. H. Prentice, Capt. R. T. Evans, Engineer A. L. Roberts. Schooners—Middlesex, Capt. Paul T. Weimer; Halsted, Capt. Edward Fitch.

Island Transportation Co., St. Ignace, Mich.: Steamers—Algoma, Capt. G. W. Boynton, Engineer Joseph Rosseau; Wau-Kon, Capt. A. R. Graves, Engineer M. J. Fleming.

Colon, J. & T., Thorold, Ont.: Steamers—Erin, Capt. P. Sullivan, Engineer J. Carr. Schooners—F. L. Danforth, Capt. John Cornwall; Maggie, Capt. John Rosie.

Donovan, Timothy, Oswego, N. Y.: Steamer—John E. Hall, Capt. Timothy Donovan, Engineer John Donovan. Schooner—John R. Noyes, Capt. M. B. Williams.

Ohio & Penn. Trans. Co., Cleveland, O.: Steamer—Alcona, Capt. W. T. Sutherland, Engineer —. Schooner—Alta, Capt. John McNamara.

Beyschlag, Chas., St. Clair, Mich.: Steamer—P. J. Ralph, Capt. Henry Leisk, Engineer W. J. Bolton. Schooner—Harold, Capt. Thos. Leisk.

Volunteer Transit Co., Thos. Wilson, Mgr., Cleveland: Steamer—Volunteer, Capt. Joe S. Wood, Engineer P. B. McCabe.

Mather, W. G., Cleveland: Steamer—Edward S. Pease, Capt. Thos. Sloan, Engineer —. Schooner—Planet, Capt. Frank Parsson.

Presque Isle Transportation Co., Cleveland: Steamer—Presque Isle, Capt. Jos. B. Lowe, Engineer E. J. Jenkins.

M. A. Hanna & Co., Agents, Cleveland: Steamers—Globe, Capt. A. C. Chapman, Engineer —.

LAKE SHIP YARD MATTERS.

One of the officers of the Craig Ship Building Co. announces that another keel will be laid at the Toledo yard of that company immediately after the launch of the steel steamer for Miller, Bull & Knowlton of New York, now nearing completion. Material for this second steamer was provided for some time ago. She will be of Welland canal size and will be built with a view to transfer to the Atlantic seaboard. The Miller, Bull & Knowlton steamer will be a very powerful vessel in proportion to dimension. She is 263 by 42 by 26 feet, and will have triple expansion engines of 22, 37 and 61 inches diameter with a common stroke of 36 inches, steam being supplied at 175 pounds pressure from two cylindrical boilers, 12 feet in diameter and 11½ feet long. The wooden steamer Preston is being rebuilt at the Craig yard, at an expense of about \$12,000, under the direction of Capt. Wm. J. Harlow. She is being lengthened 48 feet, and it is expected that this will give her a capacity of a million feet of dry pine on a draught of 12 feet. Other improvements include steel arches, as well as steel keelsons, and steel plates under the rail from house to house on both sides; also new stack and boiler breeching with new boiler house.

A new dry dock, this time of 550 feet length, is again talked of at Detroit, probably at the Springwells plant. This is an improvement that will soon be an absolute necessity as a part of the Detroit Dry Dock Co.'s Works, if that establishment is to be kept up with the progress required in lake ship yards, and it will come later on if Detroit is not sidetracked in the big things that have been talked of lately.

It is announced from West Bay City that work will begin shortly at the ship yard of James Davidson on a large wooden tug for towing and wrecking purposes.

WATER PIPES IN FREIGHT COMPARTMENTS

The Inland Lloyds Vessel Register for the coming year, now in the hands of the printer, will contain a rule regarding water pipes in cargo spaces that is of special interest to owners of vessels engaged in the grain trade on the great lakes. This new rule will be about as follows:

"Vessels carrying perishable cargo—Water pipes in freight spaces must be enclosed within another pipe, the casing pipe to have water tight joints. Vessels with bulwarks may, if preferable, run the pipes above the spar deck, in which case the casing pipe will not be required."

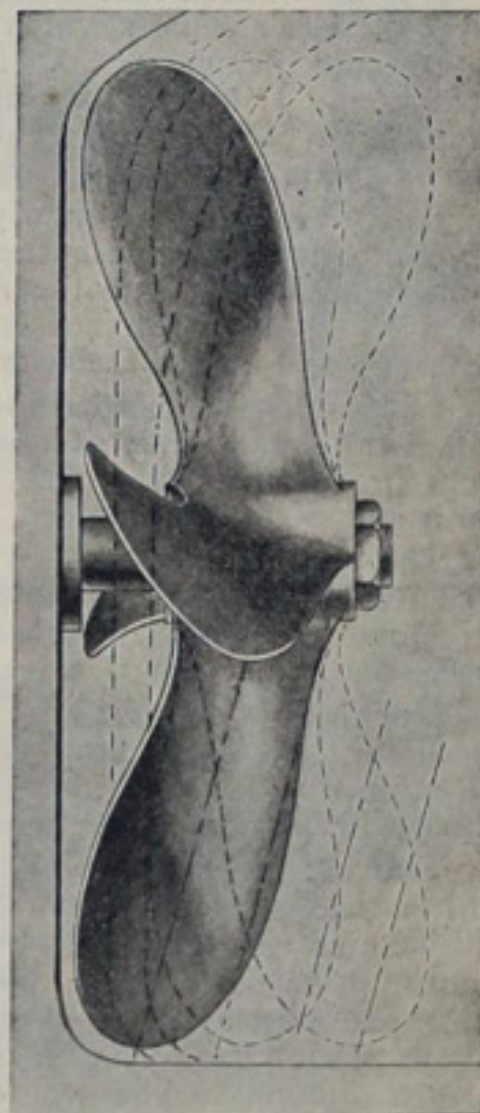
In explanation of this rule a ship owner who is also interested in insurance says: "It is not uncommon for water pipes running through the length of the ship to freeze and burst, thus damaging cargo. Pipes become rust-eaten and leaky and sometimes pull apart in the joints and large damages to cargo result also from this cause. Since the enactment of the Harter law, underwriters have been called upon to pay for damage of this kind, whether pipes were pulled apart, either from the ship straining at sea or from imperfect pipe fitting, or from the bursting of pipes caused by water in them freezing. During the past fall there were several cases of pipes bursting with the loss of a large quantity of wheat. One case was that of a pipe pulling apart or breaking at a joint, this resulting from imperfect pipe fitting. In this case there was also a large quantity of grain damaged. It would seem that the underwriters are reasonable and clearly within their rights in insisting that measures be taken to do away with this source of loss."

CASE OUTWARD THRUST PROPELLER WHEEL.

Characteristic of A. Wells Case & Son of Highland Park, Conn., is an advertisement that appears elsewhere in this issue pertaining to the Case outward thrust propeller wheels. "Examine this wheel," says the advertisement. "It gives more light on the subject of screw propulsion than all the volumes ever published. Men of advanced ideas are getting their eyes open to the importance of claims made for this wheel. Orders will receive as prompt attention as is consistent with rush of business." The money that has been spent in experiments with all manner of designs for propeller wheels is probably equaled in no other line except electricity. Patent office records are full of propeller designs, most of them absolutely worthless. But there is nothing visionary about this wheel. After years of constant labor on the part of the promoters, it is now being made on an extensive scale at the works of A. Wells Case & Son, and from all parts of the United States most flattering reports are made regarding hundreds of the wheels that have been in use for a long time past. John S. Newberry, owner of the Herreshoff-built yacht Dawn of Detroit, and Alfred E. Brush, owner of the Sea Fox of Detroit, both fast vessels, tell of marked improvement in speed attained through the use of this type of wheel. Owners of the I. C. U., also of Detroit, are among others who are in position to speak of its advantages. The manufacturers have hundreds of letters similar to those received from the Detroit people, but the best evidence of the success of the wheel is the crowding of orders referred to above.

The object sought in the construction of this kind of wheel is to obtain, as far as possible, a solid backing or resistance to the blades of the screw while in motion, and by satisfactory tests it has been demonstrated that the outward thrust principle, as applied to the Case wheel is theoretically, mathematically and practically correct, whether working in a liquid or under atmospheric conditions. The blades of this propeller are backed by solid water or water outside of the course of the wheel and undisturbed by it.

The yacht American of New York, Commodore Archibald Watt, owner, which is now making ready for a trip around the world, has twin screws of the Case type of 8 feet diameter.



WITH THE BUSY SHIP BUILDERS.

NOTHING BUT WORK IN SIGHT AT COAST, LAKE AND RIVER YARD—MATERIAL AND SUPPLY HOUSES ARE ALSO SHARING IN THE GENERAL PROSPEROUS CONDITIONS.

George S. Dearborn, president of the newly organized American-Hawaiian Steamship Co., announces that the company is now negotiating with eastern ship builders for the construction of three modern steamships. The vessels are to be about 415 feet long, of a cargo carrying capacity of 8,500 tons, and will have a speed of 10½ knots. In addition to Mr. Dearborn, the gentlemen interested in the company are W. B. Flint, vice president and treasurer; A. Chesebrough of San Francisco, second vice president, and H. G. D. Jackson, secretary. The names of Oscar T. Sewall of Williams, Diamond & Co. and James H. Post of B. H. Howells, Son & Co., both of New York, also figure among the incorporators. The office of the company is at 11 Broadway, New York.

Elaborate ceremonies attended the laying of the keel for the first of the three United States torpedo boats at the yard of the William R. Trigg Co., and which marked of course the inauguration of the ship building industry at Richmond, Va. Among the guests present were the officers of the company—W. R. Trigg, president; L. T. Myers, vice president; W. C. Preston, secretary and treasurer; J. A. Nelson, general superintendent, and Master Mechanic Alexander Cruikshanks. Past Assistant Engineer W. Strother Smith and Assistant Naval Constructor J. E. McDonald, who will supervise the construction of the vessels for the navy department, were also present.

A triple launching took place, a few days ago, at the Union Iron Works, San Francisco. Three tugs which slid into the water were the Fearless, building for John D. Spreckels Bros. & Co.; the Union, for builders' account, and the Wallula, building for the Oregon Railway and Navigation Co. The Fearless and Wallula are sister vessels of the Active, which was sold to the United States government at the opening of the Spanish-American war. The new boats are 100 feet in length, 22½ feet beam and of 600 I. H. P. The Union is a sister boat of the Rockaway.

Seven vessels are now under construction at the works of the Maryland Steel Co., Sparrow's Point, Md., and the company is almost ready to begin work on the floating dry dock to be located at Algiers, La., and for which it was recently awarded the contract by the United States government. At present there are more than 1,800 men employed at the Sparrow's Point yard and this number will be increased, within a few weeks, to 2,500. Fully 400 of the workmen live in the city of Baltimore and make the trip to and from the ship yard daily.

The Marietta Manufacturing Co., Marietta, O., has secured a contract for machinery for the \$100,000 river tug, to be built at Pittsburg for the Pittsburg Transportation Co. The contract calls for tandem compound condensing engines, with cylinders 21 and 44 inches by 9 feet stroke. The shaft will be 16½ inches diameter in the journals and 18 inches at the center.

The contract for repairing the American Steamship Co.'s steamer Admiral Dewey, which recently stranded on the Massachusetts coast, has been awarded to the Atlantic Works, East Boston. The steamer will require twenty-five new plates, twenty-five plates removed and repaired and several new frames and floors, and the aggregate cost will be in the neighborhood of \$33,000.

It is announced that contracts have been signed for the three freight and passenger steamers which the Wm. Cramp & Sons Co. will build for the Oceanic Steamship Co. It is stated that the vessels will be of 6,000 net tons and 17 knots speed and will have a cargo capacity of 2,000 tons, independent of coal. The equipment will include all modern appliances such as machinery for electric lighting, distilling and refrigerating.

Henry G. Morse, formerly president of the Harlan & Hollingsworth Co., announces that the entire \$3,000,000 necessary for the establishment of his new ship yard on the Atlantic coast has been subscribed and that the work of establishment will now go forward. Sites at New York, Baltimore and on the Delaware river are under consideration.

Lewis Nixon, Elizabethport, N. J., has just secured from a Boston man, whose name has not been made public, the contract for a steam yacht of 148 feet water line, 166 feet over all, 23 feet beam, 13½ feet depth and of 14 knots speed, with Almy water tube boilers.

The J. S. Kimball Co. of Oakland, Cal., has been incorporated with a capital of \$500,000 to build and operate steam and sailing vessels. Directors are John S. Kimball and Charles E. Kimball of Oakland, and John H. Bullock and Charles E. Wilson of San Francisco.

Machinery and boilers for the new United States revenue cutter building at the Columbian Iron Works, Baltimore, for the New York station are completed and work will be pushed after the launching of the vessel, which will take place the latter part of the month.

Five barges are building at the yard of Wilson Rickenbach of Stockton, N. J., for Peter Hagan & Co. of Philadelphia. Each of the barges will have a capacity of 750 tons and the total cost will be in the neighborhood of \$20,000.

David Greeley is building at Greeley's Mills, Me., a small steamer for use on Sebec lake. The vessel will be 62 feet over all, 14 feet beam, and carry a 25 horse power engine. The cost will be in the neighborhood of \$3,000.

Charles Reeder & Sons, Baltimore, Md., are making good progress with the new steamer for the Queen Anne Railway Co. Frames are up and the work of putting on the plates will begin within a few days.

Capt. T. A. Ellery, Marysville, Mich., is rebuilding his wooden steamer J. E. Mills. This vessel will be greatly improved in rails, stringers, stanchions, etc., when she reenters the lake trade in the spring.

The steamer Nantucket, building by the Harlan & Hollingsworth Co., Wilmington, Del., for the Merchants' & Miners' Transportation Co., is scheduled for launching this (Thursday) afternoon.

The steamer Cape Charles, recently built at the Roach ship yard,

Chester, Pa., and which was burned at Norfolk, Va., soon after going into commission, is being rebuilt at the Roach yard.

The new Pittsburg Transportation Co. will, it is announced, build a \$100,000 tug that will be the largest on the western rivers, for service between Pittsburg and New Orleans.

New bending furnaces are being installed at the yard of the Harlan & Hollingsworth Co., Wilmington, Del. The office of the ship yard will be moved to make way for them.

Moore's ship yard, St. Paul, Minn., is busy on half a dozen steam launches for use on Lake Minnetonka. Among the craft are two 45 and three 30-foot boats.

The Springfield Boiler & Manufacturing Co., Springfield, Ill., has secured, on a bid of \$14,650, the contract for the construction of the steel hull, spud frame and cutter frame for the dredge Ram.

Calvin Adams, Calais, Me., is building a gasoline launch for Swain Nordstrom of that city. The length is 30 feet. Mr. Adams was formerly connected with the Herreshoff Co.

William Fetterly and B. Starbuck will open a boat building establishment at Traverse City, Mich., under the name Eclipse Motor & Boat Co.

W. H. Hanna, Charleston, W. Va., will build a crane boat for the United States engineer at that place. The price is \$1,200.

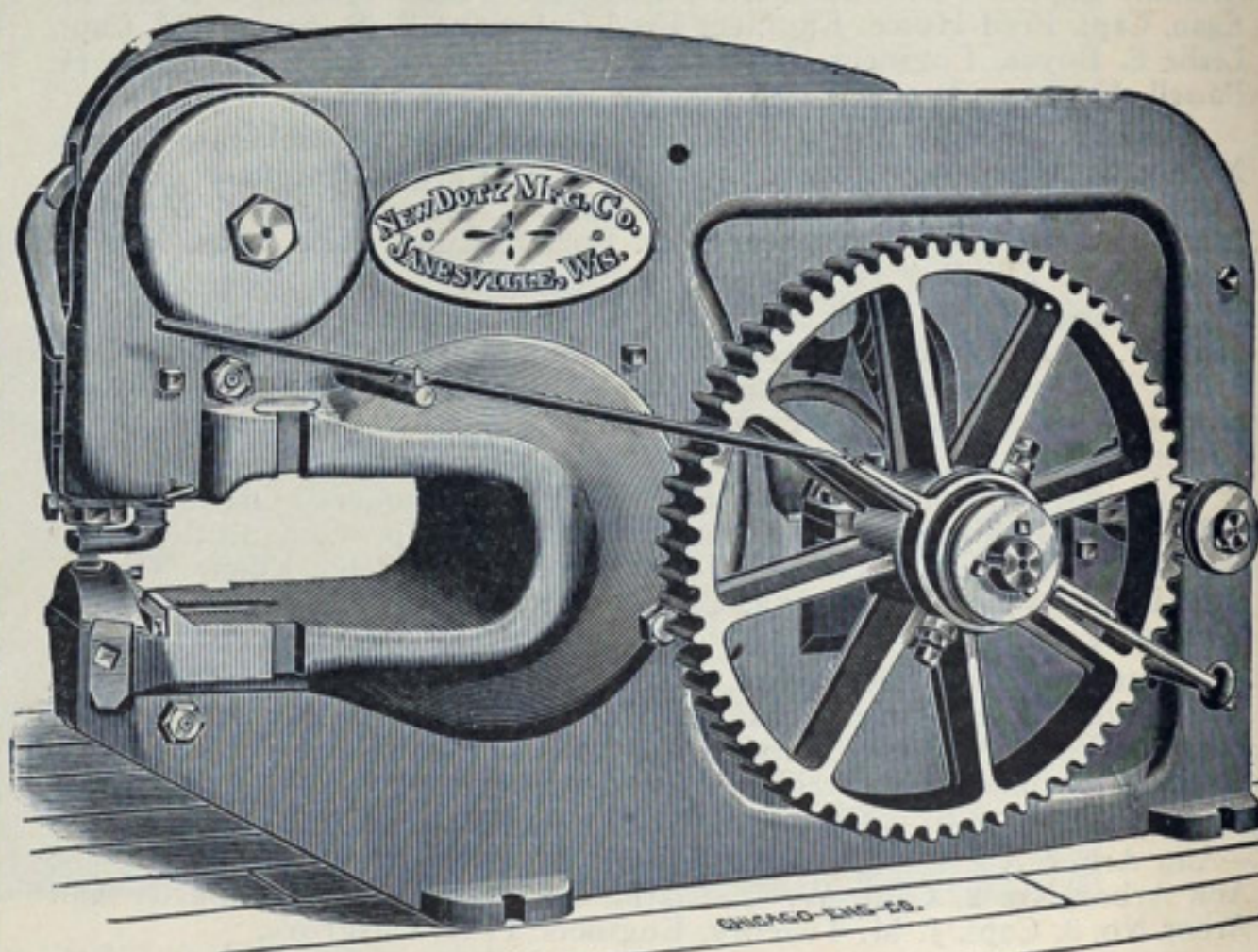
John P. Story of Essex, Mass., has begun the construction of a schooner in the yard of John Bishop of Gloucester, Mass.

Davidson & Griffin, boat builders of South Portland, Me., are building two steam launches for western parties.

An addition has been made to Stearn's boat building establishment at Marblehead, Mass., and work is in progress on several vessels.

NEW BELT POWER PUNCH.

The belt power punch shown in the accompanying engraving is manufactured by the New Doty Manufacturing Co., Janesville, Wis., for use in boiler shops and sheet iron works of all kinds. These punches are built from new patterns in the different sizes, ranging in weight from 150 to 8,000 pounds. The smallest one will punch a ¼-inch hole in ¼-inch iron or its equivalent to the center of 4 inches, and the largest will punch a 1-inch hole in ¾-inch iron or its equivalent to the center of 74 inches. These machines are strong and well proportioned. All shafts, bolts and plungers are of steel, and every machine is fitted with an improved stripper, which can be adjusted to the 1-1000 part of an inch.



The deeper jawed machines are provided with links, and when these are adjusted the machines will do heavier work. All have tight and loose pulleys, and start and stop with a clutch worked by a lever. They can be started and stopped instantly, thus holding the punch at any desired point. The distance from the center of punch to the front of machines is but ¾ inch, thus enabling the operator to punch flanges.

TRADE NOTES.

The Safety Car Heating & Lighting Co. of New York has just been awarded a \$21,600 contract for Pintsch gas buoys by the light-house board. An award was made at the same time to the Lebanon Chain Works for more than \$30,000 worth of chains.

The demand for high grade pine decking was never better among ship builders according to reports from the Cleveland Saw Mill & Lumber Co. of Cleveland. They have shipped in the past few days two car loads to Geo. H. Reeves of Brooklyn, N. Y., for the American Fisheries Co. of Fall River, and one car load each to D. M. Nesbit of New York and E. J. Hammond of Boston.

Wilson & Silsby of Boston, well-known sail makers, who have probably fitted as many racing yachts as any other firm in the country, announce in a very neat little folder the fact that they are now located in a new loft on the north side of Rowe's wharf, directly opposite the Massachusetts Yacht Club house, or in other words in the rear of their old location. Their new loft, built expressly for them, contains 5,120 square feet of floor space, is heated by steam and lighted by electricity and is one of the best equipped sail lofts in the United States.

It is seldom that people in the engineering field, or for that matter in any other field, have an opportunity to see a booklet as highly artistic as the second edition of the catalogue of steel plate fans, which has just

been issued by the B. F. Sturtevant Co. of Boston. Of the subject matter little need be said to those who saw the first edition, and indeed almost everybody interested secured one or wanted to. The whole subject is detailed, and a very complete collection of illustrations aid to convey all the information that might be desired.

Another neat and attractive catalogue has been issued by the Detroit Sheet Metal & Brass Works, Detroit, Mich. Following a brief description of the twelve departments of this concern, are given illustrated descriptions of their leading specialties in marine hardware, brass, bronze and aluminum goods. Lubricating devices, plumbing goods and a general line of marine hardware manufactured by this firm are used on the United States transports Grant, Sherman and Massachusetts, the revenue cutters Algonquin, Gresham and Marigold and a large number of the principal passenger and cargo steamers of the great lakes.

The lowest rates east or west are offered via the Nickel Plate road. With solid through trains to New York, through sleeping cars to Boston and direct connections at Chicago for all points west, travelers via this deservedly popular low rate line are offered all the conveniences of an exacting traveling public. Then, too, the quality of the service is unsurpassed. Modern day coaches and luxurious sleeping cars contribute to the comfort of passengers, while unexcelled dining cars cater to the tastes of the most exacting.

No. 16, April 10.

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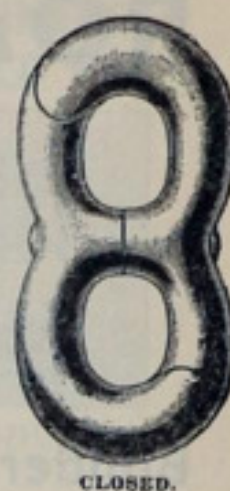
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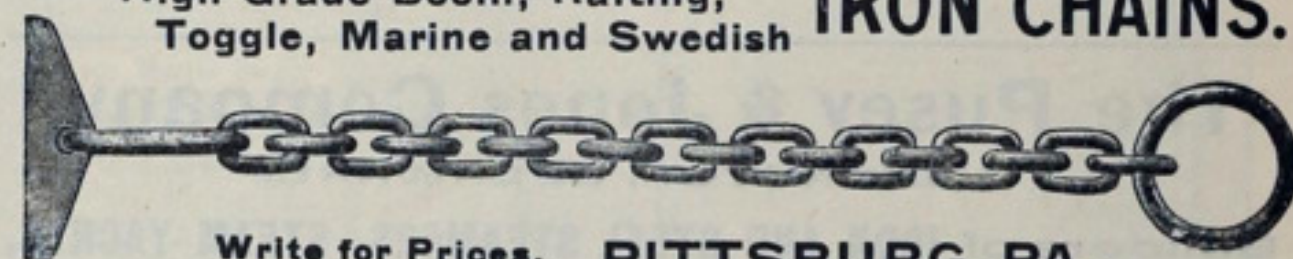
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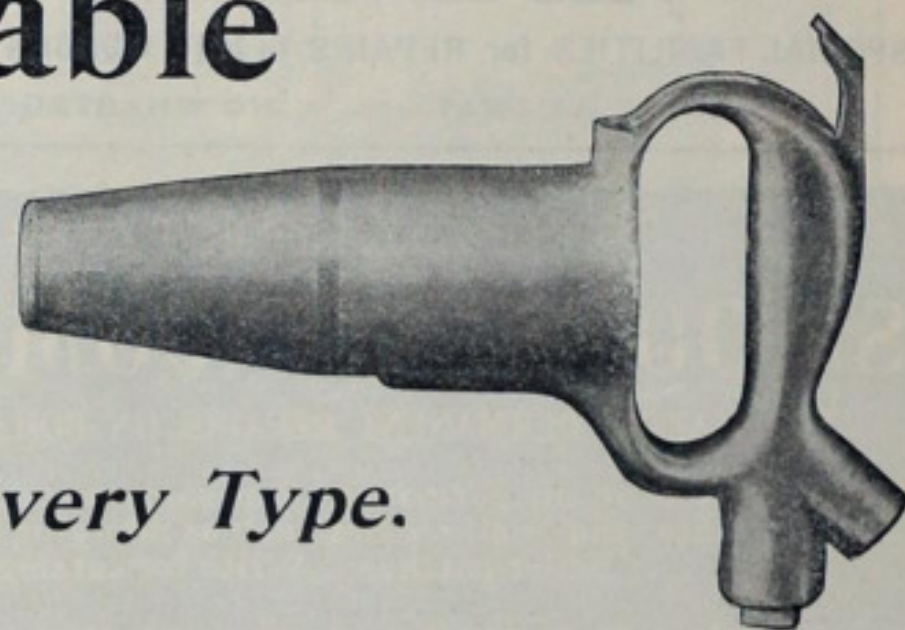


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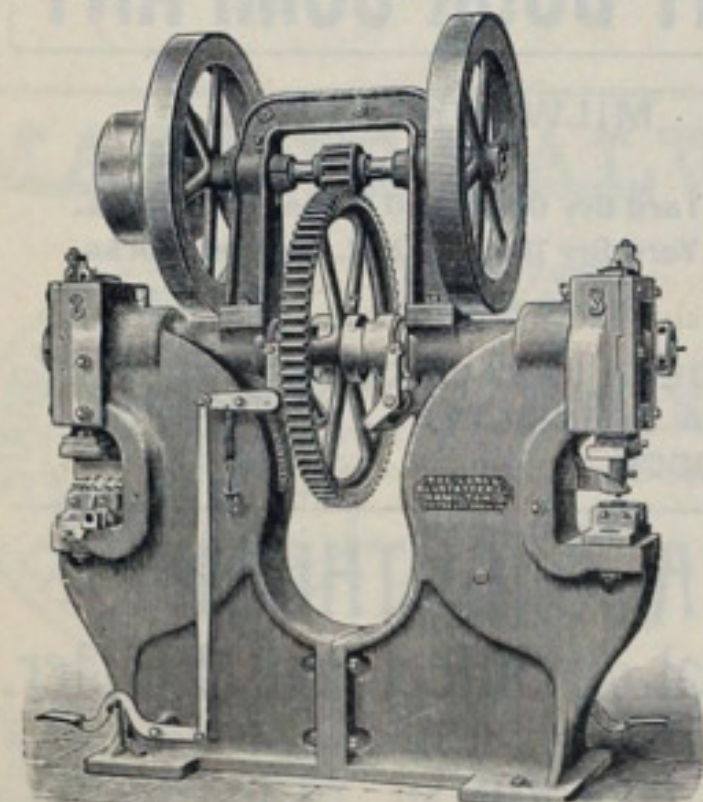
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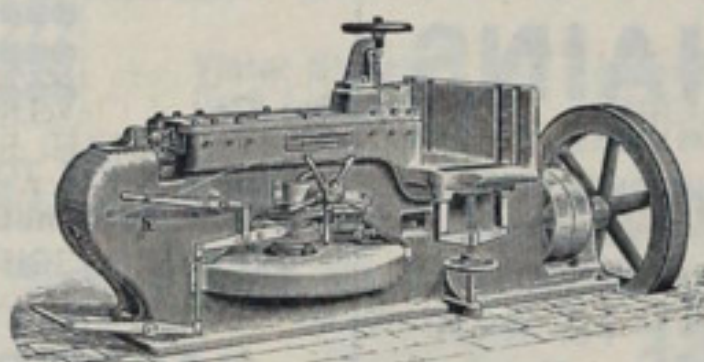
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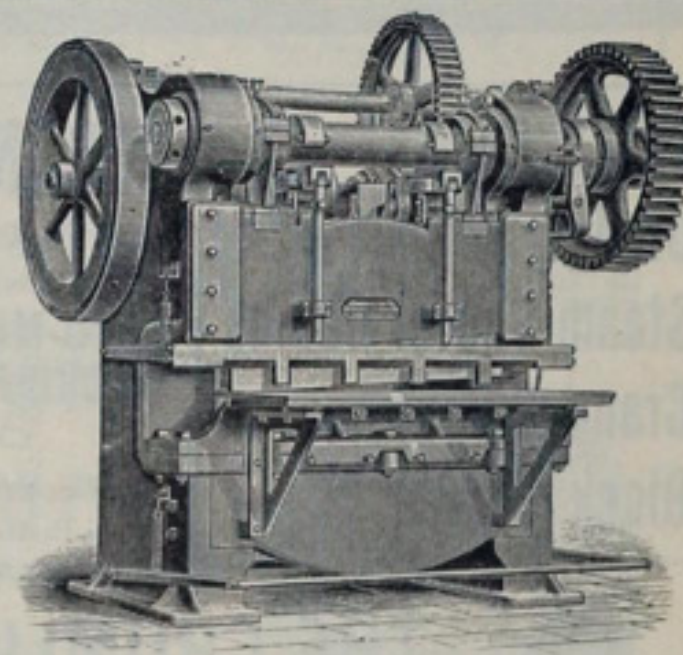
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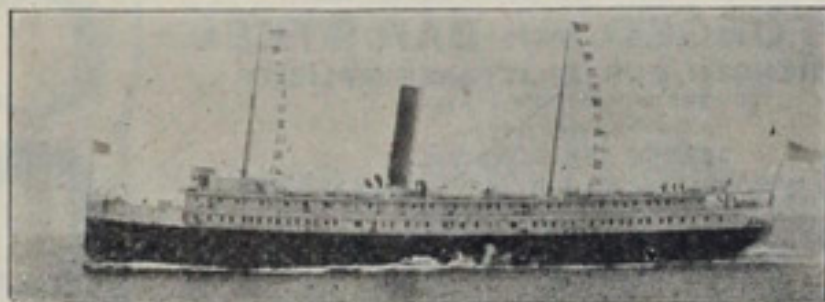
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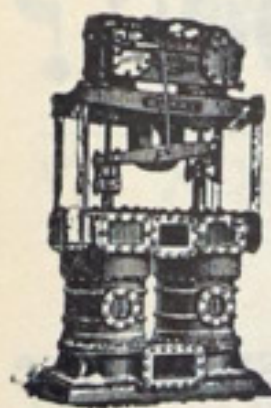
Yard: 92d St. and Calumet River.

Office: 141 S. Water St. CHICAGO, ILL.

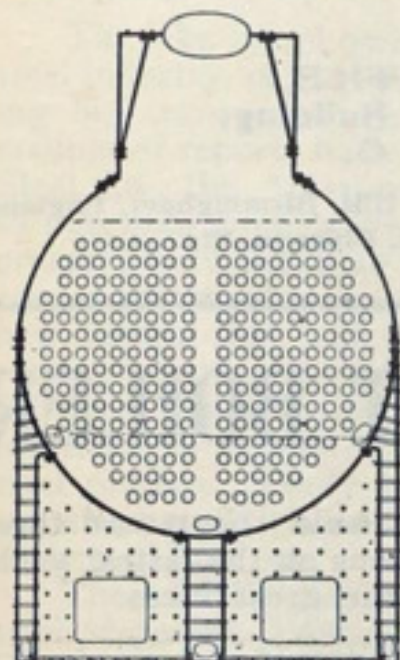
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J. H. WILLARD, Maj. Eng'rs. Mar. 23.

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26	27	28	29	30	31

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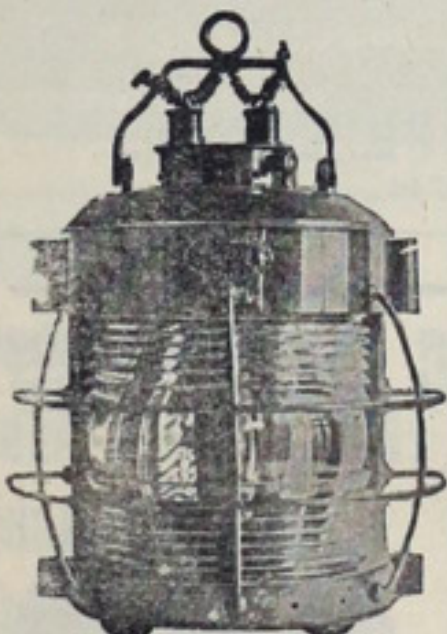
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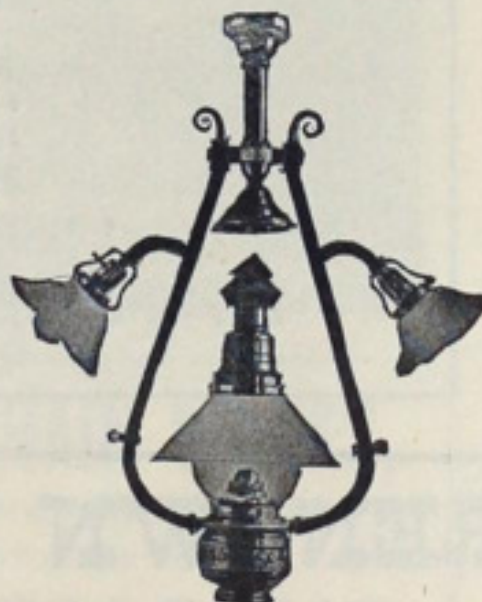
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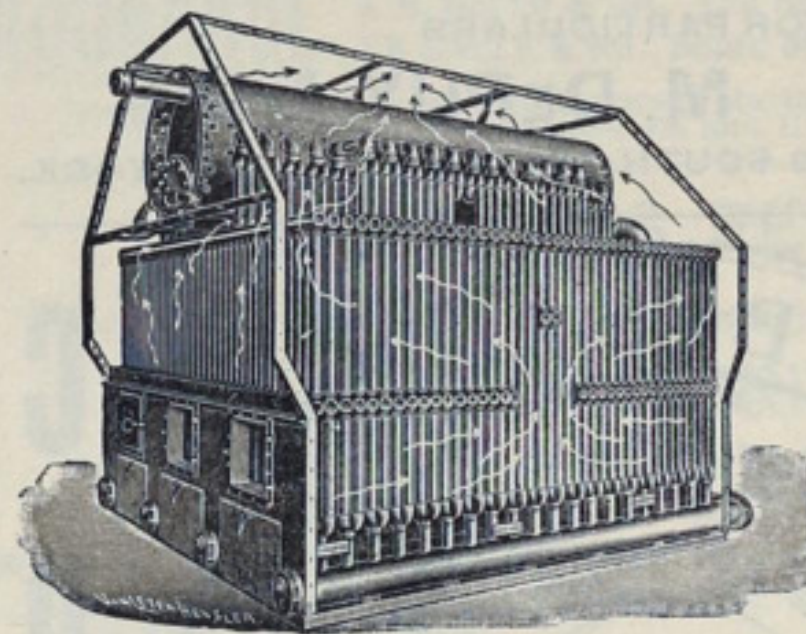


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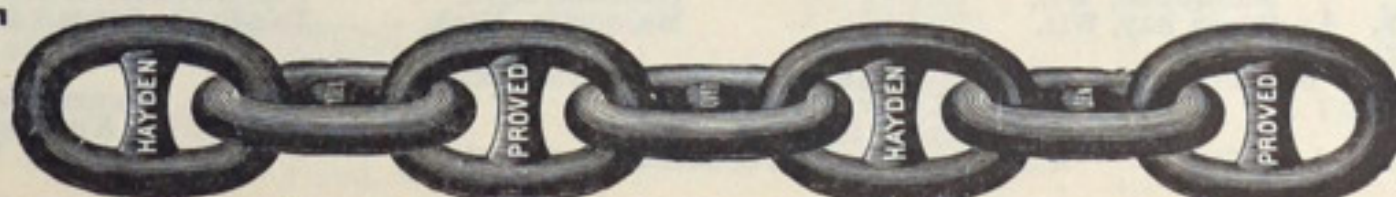


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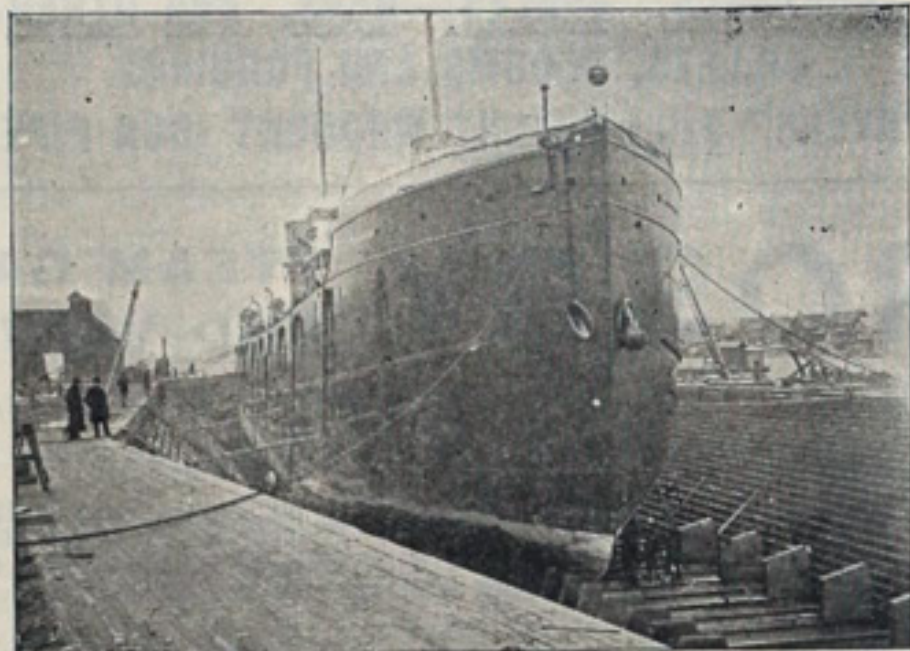
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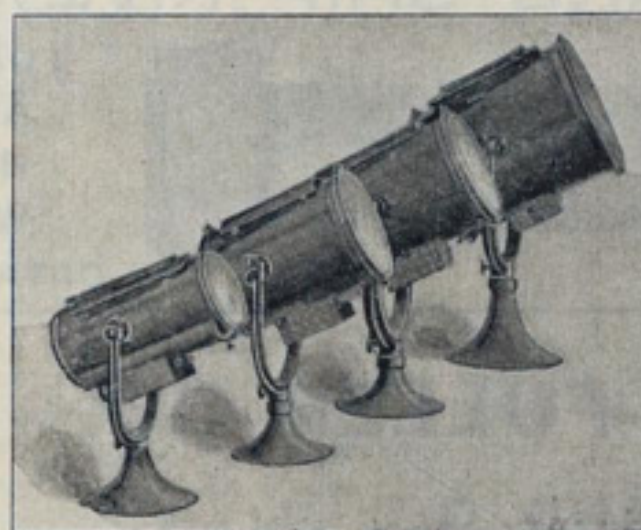
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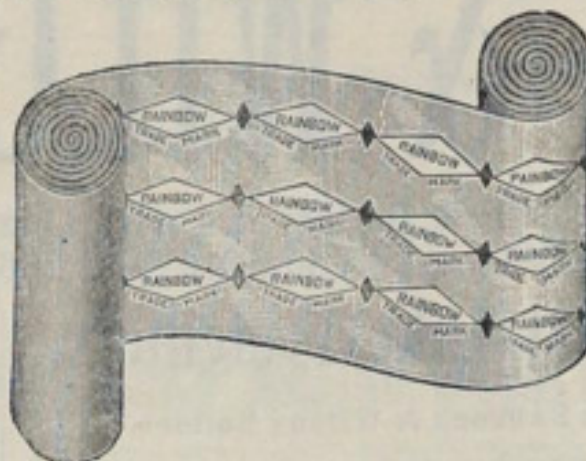
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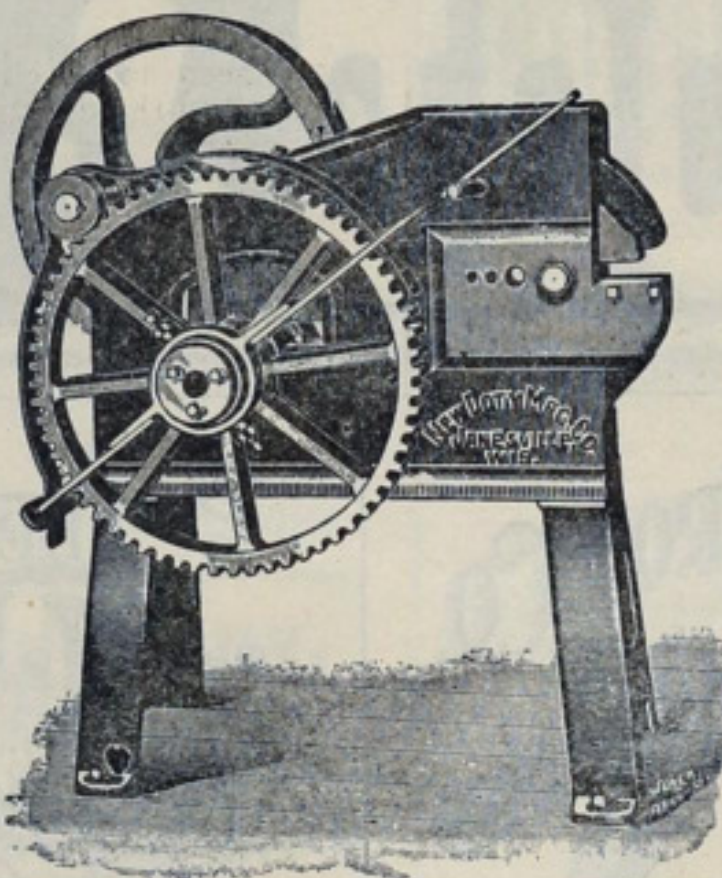
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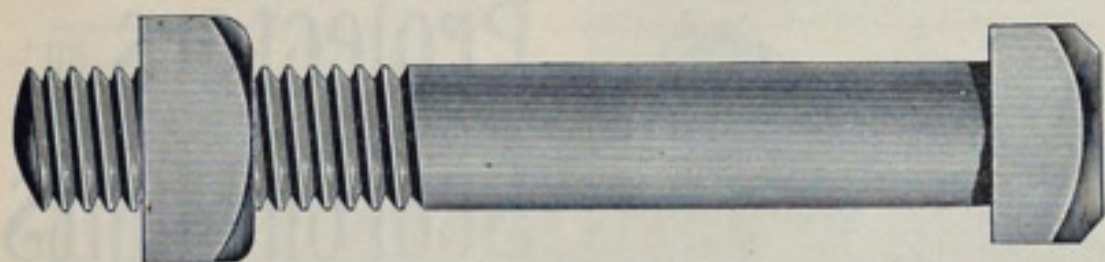
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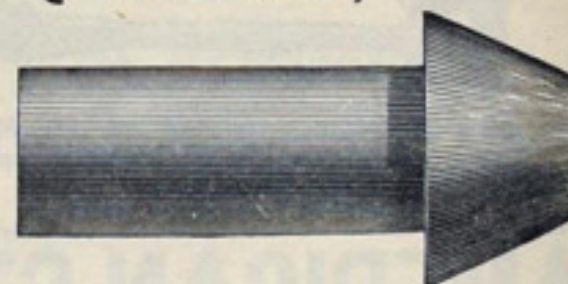
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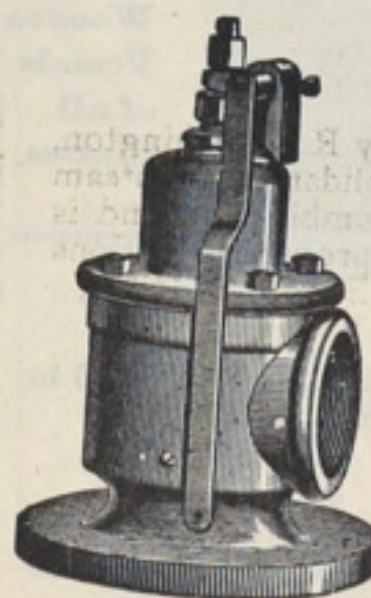
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